IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication JULY 27, 1961

★ Metalworking's Technological Explosion:

Industry's Search For Tomorrow's Power p. 105

Business Crisis in South America p. 77

How to Code Look-Alike Parts p. 115

Digest of the Week p. 2-3

another torture test for leaded alloy

This guide bushing is a much abused part in a pneumatic rock drill—subjected to severe shock loads and a shattering type of vibrational stress. It is machined from a bar of lead-treated* Aristoloy 8620, carburized and hardened to a 58-63 Rockwell "C". When GARDNER-DENVER switched to lead-treated steel, they happily discovered production jumped 42%. Feed rates, drilling, turning, forming, boring, and cut-off operations could also be increased. Tool life was extended 20 pieces between grinds.

For complete information about how you can get alloy steel strength in free-machining steel, call your nearest Copperweld representative. Or write for Leaded Steels Catalog and Products & Facilities Catalog.

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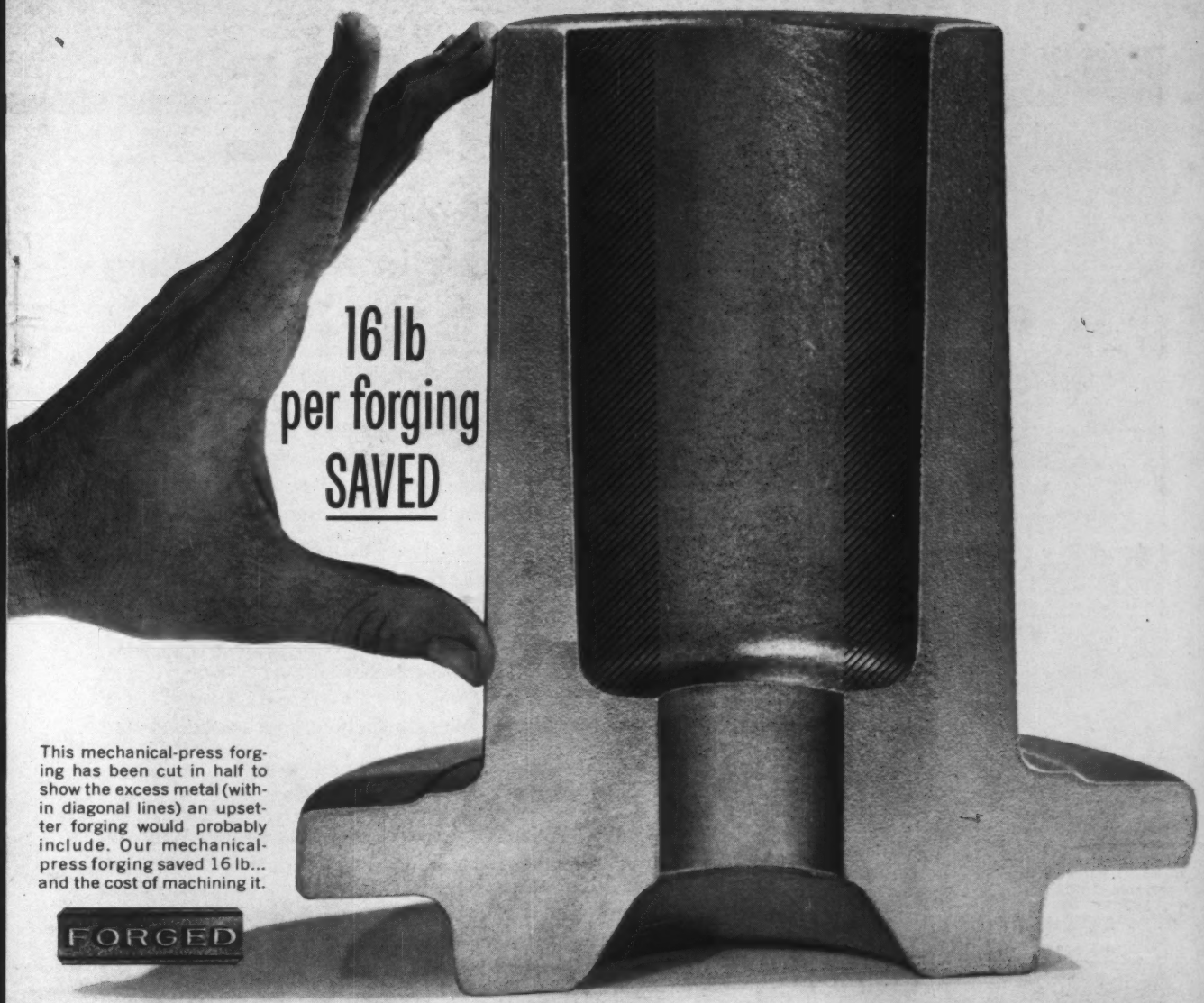
16 lb
per forging
SAVED
This mechanical-press forging has been cut in half to show the excess metal (within diagonal lines) an upsetter forging would probably include. Our mechanical-press forging saved 16 lb... and the cost of machining it.
FORGED

thanks to ingenuity and a mechanical press

Most shops would make this forging (a cone drive gear) the *conventional* way—on an upsetter. The forging would weigh 73¾ lb.

Bethlehem, using a little ingenuity, makes it on a mechanical press. The forging weighs only 57¾ lb.

There's a 16 lb difference. 16 lb of steel our customer doesn't pay for . . . or pay to machine away.

When you make a forging on an upsetter, you're limited to punching through with a straight hole. When you make a forging on a mechanical press, you can (if you know how) forge closely to the final shape. This saves our customer a lot of metal and a lot of machining.

Why then couldn't *any* forge shop handle this job? For two reasons: (1) Not every forge shop is equipped with a mechanical press. (Bethlehem has 6.) (2) Not every forge shop is staffed with craftsmen who can make a mechanical press do tricks. (Our shop is; our men can.) Try us. You'll like the savings.

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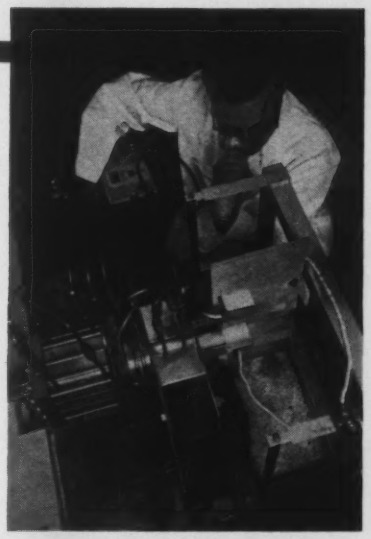
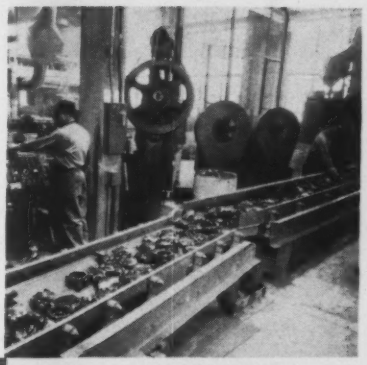


How Future Power Systems Shape Up

This week's special report is the second in a series on Metalworking's Technological Explosion. Many of the basic concepts for Future Power Systems are already well along. Our cover photo shows one of Westinghouse's experimental magnetohydrodynamic generators which makes use of plasma gas. p. 105

South America: Business Amid Crisis

Venezuela, under President Betancourt (right), is a pilot plan for a "new" democracy in South America. What happens there may set the trend. Tom Campbell gives an on-the-scene report of a continent in turmoil and some tips for business. p. 77



Automation Helps Foundry to Expand

In a crowded city, foundry expansion can only go so far. Faced with no growing space, one company decided to build a new plant from the ground up. Automation in this new bronze foundry yields major benefits. Even the moldmakers are now automatic. p. 118

Next Week

Are Industrial Prices Going Up?

It's a buyers' market for many industrial products and bidding for contracts is at its sharpest. But there are signs that prices may be firm and head upward. Next week's Special Report analyzes industrial price trends and the areas of probable change.

How would you solve this problem?

This roller-end component was produced from cold finished bar stock. During machining of the close-tolerance load-bearing surface, these problems were encountered: frequent tearing sent reject rate sky-high, slowed down production—and tool life was abnormally short.

A Ryerson Metalogics specialist analyzed the problem and suggested Ledloy® 375, world's fastest machining steel. This proved an excellent choice—rejects virtually vanished. Ledloy 375 boosted tool life . . . cut machine down-time . . . permitted increased feeds . . . and gave a better finish.

And here's why Ledloy steels from Ryerson assure you of top machinability with consistency. No two mills get the same results in steelmaking. So Ryerson buys all Ledloy "hot stock" from just *one* mill. Their exacting quality standards, and our own rigid controls, assure you top machinability—consistently.

Ask your Ryerson representative to help you value-analyze your production problems. You'll get unbiased recommendations on free-machining steels of every kind—as well as aluminum and industrial plastics. Be Metalogical—call Ryerson.

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Report From South America

South Of The Border: Our Troubles Are Piling Up!

While we worry and fret about Berlin, troubles are brewing for us to the south. Some of them are of our making. Many are the result of past indifference by wealthy Latins. But the biggest contributors to unrest and trouble to come are the Communists.

We were told that the peoples' rebellions in several South American nations were a natural nationalism fostered by democratic revolutions. Maybe they were, but there was more to it than that. Cuba proved that. And, more recently, the drift to the left by all major Venezuelan parties shows what borers-from-within can do.

There are tendencies towards collapse in some Latin nations. Things are not as good as they should be in Venezuela, Brazil, Peru, and even Argentina. The Reds know this. They are not going to tell us what they intend to do. Nevertheless, it is clear what they will do. They will try to undermine any attempt to bring stability and order to Latin America.

Communists hope we will make blunders in our foreign aid program in Latin America. It would please them no end to see money go down the drain. They will try to wreck all attempts to see that loans are used for purposes that will be of some use and value to Latin countries.

The Communists have an edge on us and our South American friends. They are dedicated to a single purpose: Destroying any good relations the U. S. has in South America. They hope to extend the Cuban satellite status to as many Latin countries as possible.

One way the Commies hope to take over in South America is to destroy, by lies, infiltration, and by posing as "nationalists," any semblance of pro-North Americanism. They have wormed their way into major parties in Venezuela.

That nation has always been a great friend of the U. S. It still is, but evidence indicates the hate-American program is making headway in a nation that used to rate first with us, after Canada, in trade and good relations.

Foreign aid is not the whole answer. In fact, if this is botched up, it will react against us there far more strongly than it has in Asia. If money goes to pay people not to work, for buying votes, or for building dreams that are of no earthly use, Mr. Khrushchev will laugh loud and long.

Latin American businessmen, government and professional people must bury their differences. Unless they do this and work for the common good of their countries, the Commies will succeed in creating eternal chaos.

Tom Campbell

Editor-in-Chief

You don't have to baby it—Ledloy® steel actually performs at its highest efficiency when you really push it! ■ Take a tip from the many shops getting amazing results with this go-the-limit steel. Increased machinability, higher speeds and feeds, reduced tool wear with greater production per tool change—all these advantages are yours—if you push Ledloy steels. ■ Inland pioneered in the making of leaded steels—has the solid background that means dependable recommendations for your kind of operation and your specific product. Be sure the leaded steels you use are Inland Ledloy steels—the result of more than 20 years of research, development and continuous production. Ledloy steels are available from your Cold Drawer or your local Steel Service Center. Send for "Properties of Ledloy Steels," an informative booklet Inland will be glad to mail at your request.

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Mixed Signs Rule Economy

A rundown of economic indicators as July closes shows more sharply than ever the mixed nature of the recovery. One of the signs of greatest promise, durable goods orders, slipped in June for the first time in 4 months. But the consumer sector stirred with new promise. Retail sales and housing starts moved up a bit in June.

Then there is the contrast of record high personal earnings and savings, but little inclination by people to borrow on time to make large purchases.

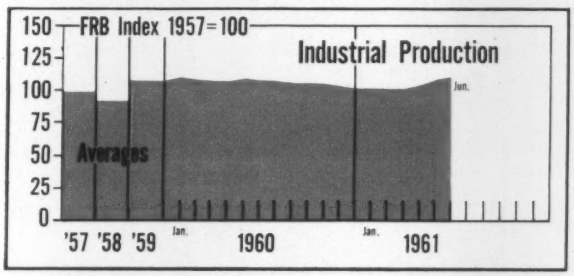
More people than ever have jobs. And more people are out of work than at any time in the last 20 years.

The mixed signs take their toll. Industrial buyers stick to hand-to-mouth buying. Businessmen don't borrow to buy or build more. And stock market prices sag and trading volume slips.

But the outlook is for a fall upsurge that will wipe out the mixed signs.

Production Index Near New High

One of the best signs on the business scene has been the steady rise since February of the Federal



Reserve Board production index. The index, which reflects the output of U.S. factories, mines, and gas and electric utilities, climbed to 110 seasonally adjusted in June. This is a 2 point rise over May.

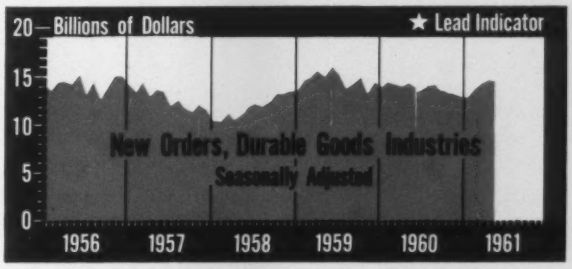
The climb started in February when the index was at 102.1. It is now only one point below the all-time high set in January 1960. Only widespread plant vacations will probably forestall a new record in July.

Durable Goods New Orders Fall

New orders received by durable goods makers in June dropped off about one percent from May. Orders for the month totaled $14.7 billion. The setback snaps a run of four consecutive months of increases.

Durable goods sales in June hit an 11-month high of $14.7 billion, up from $14.6 billion in May.

Normally, when businesses take in fewer orders than they ship, a brake is put on buying. And stock liquidation takes hold or deepens. This is not now likely. Four straight months of orders in excess of



shipments have given factories something to work on during summer letdown. Fall promises more orders.

Rally Set for Farm Equipment

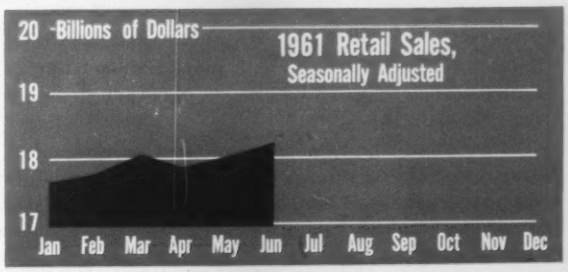
Farm equipment makers, fresh from recession headaches, are now facing extreme drought in the northern plain areas and cutbacks in small grain acreage. But don't write them off as a boost to the economy.

Implement manufacturers are meeting their dual problem head-on by making farm work more automatic. Materials handling equipment for the farm, for example, is a rapidly expanding market. Also, the suburban and exurban market for small implements is being pushed.

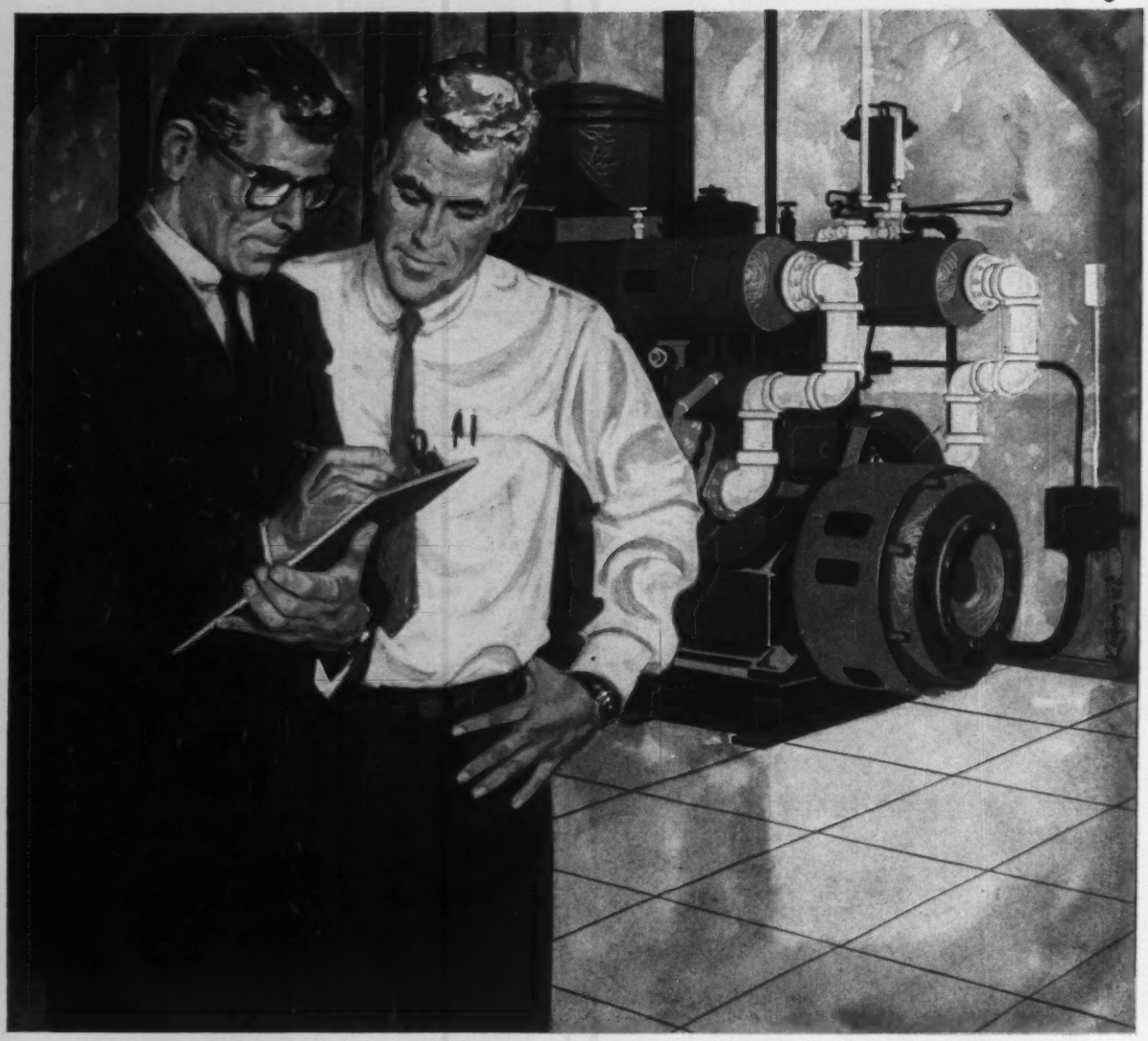
Retail Sales Show Gain in June

Retail sales in June, after allowing for seasonal factors, rose to $18.3 billion, up 1 pct from May. This matches the May retail sales gain over April.

Durable goods sales, sharing the general rise, also rose by 1 pct in June to $5.7 billion. This is 5 pct under June 1960 sales level.



Consumer spending is not keeping up with income gains. This worries many in industry. They are looking for stronger end-product demand to support their swing from inventory liquidation.



He makes air power earn more than its keep

This man knows how to put air to work. He's the Gardner-Denver Compressed Air Specialist, and every business day he helps plan air power for factory production lines. He consults with plant engineers, helps design new compressed air systems, or helps rejuvenate present air facilities.

After a Gardner-Denver compressed air system has been installed, he returns to these plants because it's his job to help methods engineers get full value from air power. He visits them time and again to see that every cubic foot of capacity earns its keep. And with his expert knowledge of the latest air power applications, he often helps cost committees with cost-saving tips.

If you've recently installed a Gardner-Denver air system, you'll be seeing this specialist soon. If you'd like to see him now, call your nearest Gardner-Denver branch.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

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IUOE: Liable To The Membership?

Is a labor union liable for damages to its members who are fired for carrying out union orders?

Ultimately, the U.S. Supreme Court may be asked to rule on this question. But a lower court has ordered the International Union of Operating Engineers to pay more than $1 million to 28 members fired by Phillips Petroleum Co.

The workers claimed the union ordered them to shutdown a plant after the company told the union to leave machinery running when a strike started.

The workers were fired for insubordination. They went to court seeking damages from the union. The union denied it ordered the shutdown.

The decision, if it stands, is significant. It establishes the responsibility of an international union and its officers to the membership in instructing them what their duties are to an employer in a strike.

Teamsters: Hoffa Loses in Chicago

Teamsters' president James R. Hoffa has met his first defeat since his reelection earlier this month.

Chicago cab drivers have pulled out of the giant transportation union despite a personal plea for support from the labor chief. In an NLRB election, drivers voted to join the Democratic Union Organizing Committee headed by a one-time president of Local 777, the Teamster's cab driver local in Chicago.

House Kills NLRB Plan

The President's plan for reorganizing the National Labor Relations Board was killed by a vote of 231 to 179 in the House. The plan would have permitted trial examiners to make initial decisions in unfair labor practices cases. Review by the board would not be mandatory. Now trial examiners only make recommendations to the five-man NLRB.

Expect More Control Over Pension Funds

Employers pay more than 75 pct of the $10 billion put into some 118,000 worker pension and welfare funds each year.

The extent of employer participation was brought out in a Dept. of Labor study made to support an Administration bill to require more protection for the funds.

Labor Secretary Arthur Goldberg says that despite the huge sums involved "there is virtually no protection of these monies under the present weak law."

Funds are now protected by the Welfare and Pension Plans Disclosure Act of 1958. But the new bill has been approved by a House Labor Subcommittee.

The study shows that employers pay 77 pct of the annual cost of pension and welfare funds combined. The plans have total assets of close to $60 billion.

UAW: Its Turn to Listen

After listening for two weeks to the United Auto Workers outline "problem areas," the automakers stepped up for their turn.

Ford Motor Co. says it won't go after many changes in its UAW contracts unless there is "economic force."

If the UAW should use force (a strike, although Ford didn't use the word) the company may run up a list of more demands.

This was the gist of Ford's bargaining counterattack by M. L. Denise, vice president-labor relations. It was made in an eight point plan for revising the contract.

Seven of eight points cover grievances, scheduling, layoffs, seniority, construction contracts, maintenance work and restrictions on non-union employees.

The other point charges "an unfavorable wage differential of 73¢ an hour" for Ford's steel division workers. The company claims its cost is $3.78 an hour compared with an average of $3.05 for steelmakers having contracts with the United Steel Workers of America.

He charges the UAW with shirking its responsibility to keep the grievance procedure uncluttered by "unmeritorious" complaints. Although only 59 cases went to an impartial umpire in 1959, he says, 211 went in 1960 and 542 in the first half of this year.

General Motors Corp. claimed that "fringe" benefits cost the company more than $500 million last year. This is an average of $124.58 a month for each hourly-rate GM worker.

Big Three automakers recessed talks with the union late last week. It is believed they were getting together to discuss the UAW suggested program and the future course of bargaining.

WESTINGHOUSE improves new transformers 5 ways with aid of REVERE ROLLED COPPER in coil winding

New design extends range of lightweight pole-type transformers to 500 Kva

In seeking to solve the problem of cross-sectional requirements in the winding of conductors in low-voltage coils of large Distribution Transformers, Westinghouse design engineers noted that their primary concern was: How to reduce the number of individual conductors in the low-voltage windings.

The final design is one which uses a sheet of copper across the width of the low-voltage coil so that one turn becomes one layer. The thickness of the sheet is varied to give the required sectional areas (see photo lower left).

Westinghouse engineers, in collaboration with Revere and other suppliers, wrestled with the problem of securing a satisfactory sheet material for this purpose for over a year. The layer insulation was designed to be sufficient for turn-to-turn insulation; this eliminated, from an electrical standpoint, the need for insulated sheet copper. However, this method presented still another problem. For, to accomplish this, the copper sheet had to be sufficiently burr free to permit the use of a single sheet of thin layer insulation. The answer to this problem was the development of a smooth Revere Rolled Copper sheet, which contributed to giving the new Westinghouse sheet-wound copper design transformer the following outstanding advantages:

1. A compact coil of great inherent mechanical strength against short circuit forces.

2. Reduction in losses and impedance by reducing the high-low space to a minimum.

3. Weight reduction directly through reduced mean turn and indirectly by eliminating coil bracing.

4. More effective cooling obtained by removing coil blocks and braces.

5. Total lower weight of unit which permitted extension of pole mountings to ratings which were previously available only in the substation type.

Find out today how Revere Rolled Copper can be used to advantage in your coil winding application.

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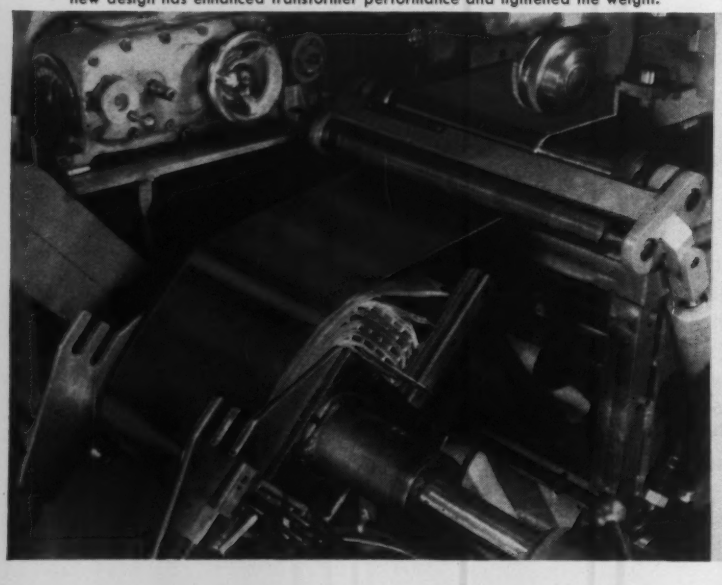
PACE-SETTING sheet-wound coil design uses a sheet of copper across the width of the coil so that one turn is one layer of the Low-voltage coil. The new design has enhanced transformer performance and lightened the weight.



ONE OF THE WESTINGHOUSE transformers—a 500 Kva, 7200 Volt rating—incorporating the new design. Previously available only in the substation type.

★ Tax Increase Hinted

Businessmen have a billion dollar stake in upcoming Washington tax actions. They could be granted $1.2 billion in tax cuts shortly, if:

1. Tax increases don't replace tax cuts.
2. Congress doesn't decide business must sacrifice tax cuts for the sake of the nation.
3. Congress doesn't adjourn too soon.

Tax talk in Washington now has two sides. On one side, the billion dollar tax cut program for purchasers of new equipment is slowly receiving legislative approval. On the other side, there are broad hints of tax increases which would hit businessmen the hardest.

Tax increase talk goes this way: The cold war has caused a multi-billion increase in defense spending. If the economy can't expand to pay for it, taxes will have to be raised. President Kennedy frowns on a tax hike.

Senate Democratic Whip Hubert H. Humphrey makes no bones about it. If the multi-billion hike for defense goes through, he says, "I'd be for a tax increase to go with it."

However it goes, the government will be prepared. Government economists are already deciding at what level of military buildup should taxes be raised.

Tax cut action goes this way. House Ways and Means Committee approved a sharply revised version of Mr. Kennedy's tax incentive plan for business. The new plan would give companies a tax cut equal to eight pct of the amount spent on income-producing equipment.

The plan now goes before the House for approval. The House seems ready to pass it. But there is some doubt that the Senate will finish action on the bill this year.

A Labor Day adjournment, which now does not seem likely, would not provide time to enact the bill. And even a later adjournment may not give time to settle the arguments Congressmen seem likely to raise about tax cuts in times of crisis.

The clue to what may come is in the now well-known statement, ". . . What can you do for your country?"

■ Military Buying Consolidation Progress

Pentagon plans for consolidation of military buying are going ahead. Though a single service of supply for the Defense Dept. has long been mired in controversy, compromise moves are being discussed.

The major hurdle is convincing Armed Service leaders they need not fear single supply leading to a single military service.

The compromise may be a joint supply agency in the Pentagon with all services represented. Studies by military supply experts, soon to be completed, are expected to support a single agency for all military supply.

■ Lead-Zinc Question May Find Answer

Government action on the lead-zinc industry question is finally straightening out. After several years of controversy and proposal of various schemes, it has just about been decided that a subsidy plan provides the answer.

The Administration, lacking support for its proposal to buy up lead and zinc surpluses, leans now toward subsidies for small producers. But subsidies now proposed in Congressional bills will not be accepted by the Administration.

A subsidy rate and the amount of lead and zinc production applicable still has to be agreed upon. Outlook for Federal aid: Agreement this year; action next year.

■ Few FTC Cases

Despite the crackdown on illegal trade practices by the Federal Trade Commission, the number of cases isn't expected to reach anywhere near the forecast level.

Total list of lawbreakers probably won't be over 500. This is nowhere near the total of 2000 violations thought possible by former FTC Chairman Earl Kintner late last year.

■ BDSA Reorganization Is Now Underway

A reorganization of the Business and Defense Services Administration (BDSA) is underway which may effect the metalworking industry divisions in the Dept. of Commerce.

So far, the new BDSA setup calls for consolidations and regroupings of divisions in fields related to metals. For instance, there is some consolidation called for between the Scientific Instruments Div. and the Office Equipment Section, and the Building Materials Section and the Construction Div.

However, Commerce Dept. sources say regrouping of the metalworking divisions is being contemplated. These divisions include the Aluminum and Magnesium Div., Copper Div., Iron and Steel Div., Metalworking Equipment Div., Miscellaneous Metals & Minerals Div.

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For 40,000 lb. Slabs at Youngstown Sheet & Tube Co.

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Electric and open hearth steel castings from 1 lb. to 100 tons

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President Names New Trade 'Czar'

The new U. S. foreign trade 'czar' will be Howard C. Petersen,

PETERSEN: A new czar.

president, Fidelity Philadelphia Trust Co., Philadelphia.

President Kennedy has asked Mr. Petersen, an advocate of freer trade between nations, to become a special foreign trade advisor to the White House. Mr. Petersen's job will be to draw up a new foreign trade program for the United States (IA—July 6, p. 13). The program will apparently be based on tariff reductions. The new czar will also have to push it through Congress.

The present reciprocal trade program expires next June 30.

As foreign trade advisor, Mr. Petersen will replace the State and Commerce Depts. in suggesting trade policy to the President. Both agencies suggested the Chief Executive replace them in this function because they felt they would be unable to sell Congress on a new program.

Belgian Steel

Belgium's steel output in 1960 reached nearly 7.8 million tons. That's 89 pct of capacity and 11 pct better than in 1959.

Of the 1960 output, 26 pct was sold locally, 31 pct went to Common Market countries, and 43 pct went to other export markets. New expansion is expected to boost capacity to 11.5 million tons.

Kennedy Prepares Tariff Battle Plans

The Kennedy Administration is plotting its attack for next year's battle over tariffs. And metalworking companies will be asked to contribute information to be used as weapons for the attack.

The Census Bureau has been ordered to find out what portion of the output of large manufacturing and processing plants in the United States is exported.

The Administration hopes to show that (1) many American workers depend directly upon exports for their wages, and (2) without foreign trade, the U. S. unemployment problem would be worse.

This idea, if proved by the census, will be the basis for arguments in 1962 when Congress decides whether or not to continue present tariff-cutting policies.

Many metalworking companies will soon receive copies of the Census Bureau questionnaires that are going out to 20,000 of the nation's large industries. Answers will be due back in Washington within 60 days after receipt.

Crude Aluminum Exports Drop

Exports of crude aluminum from the U. S. dropped again in May, according to the Dept. of Commerce.

May exports were 13.9 million lb compared with 15.9 million lb in April. Aluminum exports have been dropping steadily since the beginning of the year. The total for the first five months this year is 111.7 million lb. The same period in 1960 resulted in exports of 274.3 million lb.

The industry generally says the drop in exports is due to the heavy inventories piled up last year. It's believed that the bottom has been reached and exporting should soon start to gain.

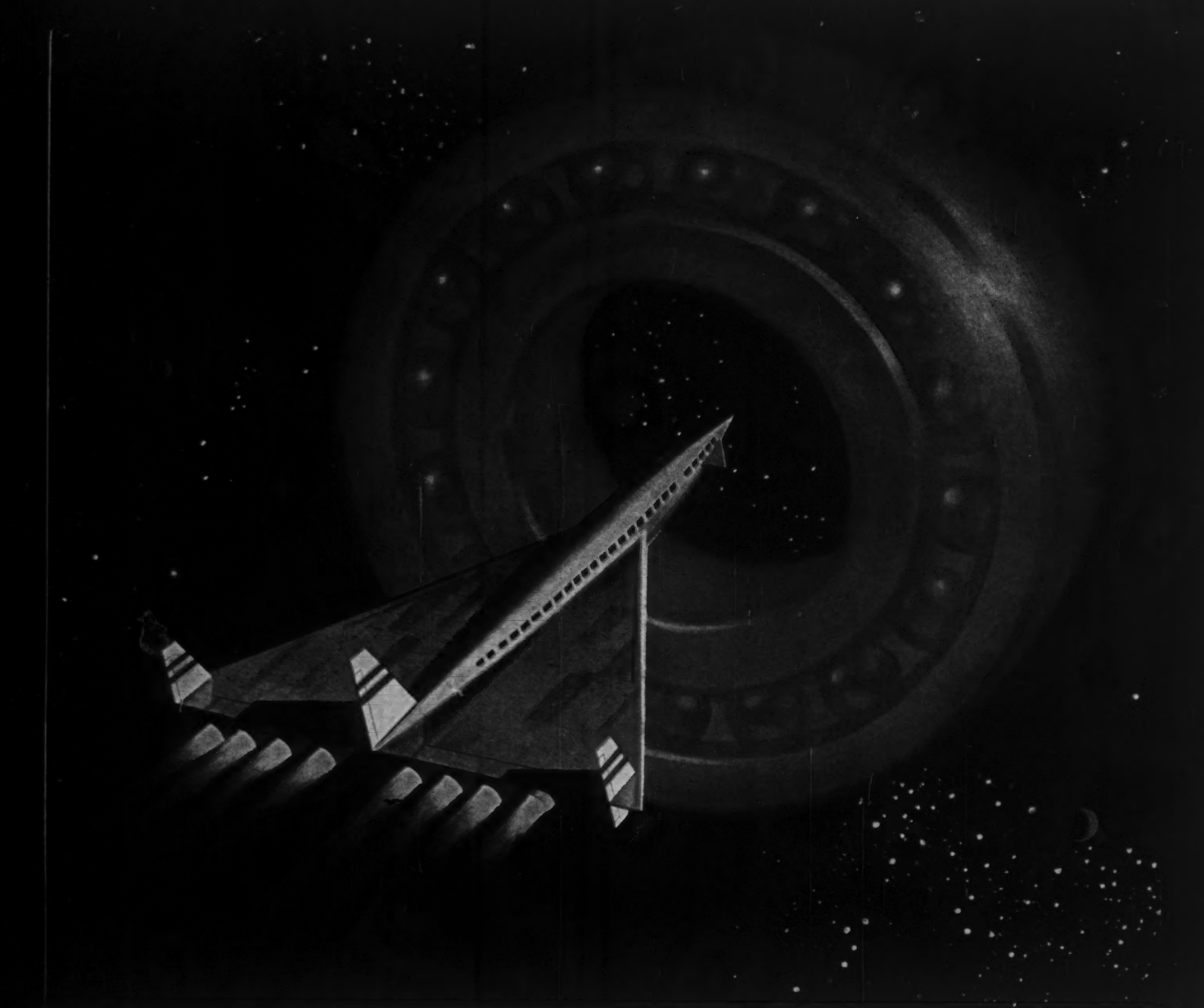
British Steel Output Is Falling Off

British steel production has fallen off in recent months. The industry's operating rate in June was 84 pct of capacity. This is compared to a rate of 87 pct in May and 95 pct of capacity in June, 1960.

And July is expected to show an additional decline. It's now considered unlikely that the British steel industry will reach its 1961 target. Steelmaking capacity in Britain last year was 25.5 million

tons. Predictions for 1961 were for 27 million tons (IA—Jan. 26, p. 13).

The disappointing performance of steel in recent months puzzles the industry. Employment and the rate of capital investment are both up in Britain. But the production index—for steel and industry in general—has not risen accordingly.



BEARING WITH A RED HOT FUTURE

SKF MOTION ENGINEERING

Advanced ball and roller bearing technology

On special test equipment in SKF's research laboratory, experimental ball and roller bearings are run at temperatures up to 1000° F and above—conditions under which steel becomes red hot and loses its strength, while conventional lubricants burn or boil away. To meet these problems, bearings made of special heat-resisting alloys and exotic new materials are tested and evaluated. New ideas in design and new approaches to lubrication are constantly being investigated.

Bearings to resist extremely high temperatures are needed for improved, high performance jet engines, gas turbines and other equipment. Special SKF bearings have been tested successfully in environments at about 1000° F. Under certain conditions of operation, much higher temperatures are practical.

Research like this is your assurance that SKF will always keep pace with demands for the highest possible performance in all major types of rolling contact bearings —ball, cylindrical roller, spherical roller, tapered roller and precision miniature. SKF Industries Inc., Philadelphia 32, Pa.

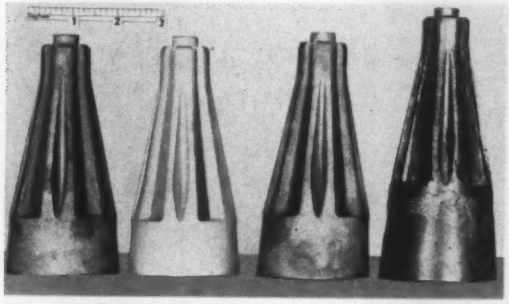
6103

Convert to Basic Oxygen

Mobile oxygen vessels are being studied as a means of using existing buildings for the basic oxygen process. If existing structures and cranes are useable, the mills can replace older furnaces with these oxygen vessels for only a little more than the cost of smoke-control equipment. Some degree of mobility is needed to fit the new process into existing openhearth shops.

Gas-Free Casting Process

An entirely new concept in making metal-casting molds has been devised at the Watertown Arsenal. This mass-production process hinges on only one binder with a refractory metal. Special treatment produces a bond that's completely insensitive to a vacuum. Thus no gases are liberated during the casting process.



TYPICAL PARTS: Include titanium.

More Direct Reduction

A new direct-reduction plant for making ferroalloys will soon be announced. No details have been released; but it's expected to be similar to the Strategic-Udy plant recently completed near Niagara Falls. This Niagara Falls installation is nearing completion of its break-in period. It will turn out ferrochrome in the near future.

Speeds Electro Shaping

For general use in electrical-discharge machining, a new electrode yields metal-removal rates up to 0.05 cu in. per hour per amp. This easily-machined shock-resistant newcomer maintains tolerances of 0.0001 in. Sections as small as 0.04 in. have been drilled with 0.019-in. diam holes. Called Gentrode 10, the new electrode is a product of the General Electric Co. Its wear ratio is 300 pct better than brass electrodes.

Plastic-Copper Marriage

Plastic copper will soon make its commercial debut. This new composite material consists of 75 pct copper and 25 pct plastic. It combines good thermal conductivity with its own inherent electrical insulation. Complete data on physical and mechanical properties aren't available. The developer's tests are now in the final stages.

Detects Minute Flaws

Using modular-design concepts, an electronic flaw finder is slated to pinpoint welds in aluminum-covered steel wires. As these wires are drawn at 1000-fps rates, the new test system will monitor all weld locations. Then it will stop the wire-drawing machine so that each weld can be cut off the drawn lengths. The new flaw finder is so sensitive it can even be set to detect tiny flaws in the aluminum coatings.

Ready for Mobilization?

Even a partial mobilization—such as the National Guard—will drastically affect industry. If it comes, look for a big drive on production mobilization. Ordnance people have tooled-up lines that are ready to go at the push of a button. Also, watch for industrial- and home-shelter requirements as part of a nuclear-defense program.

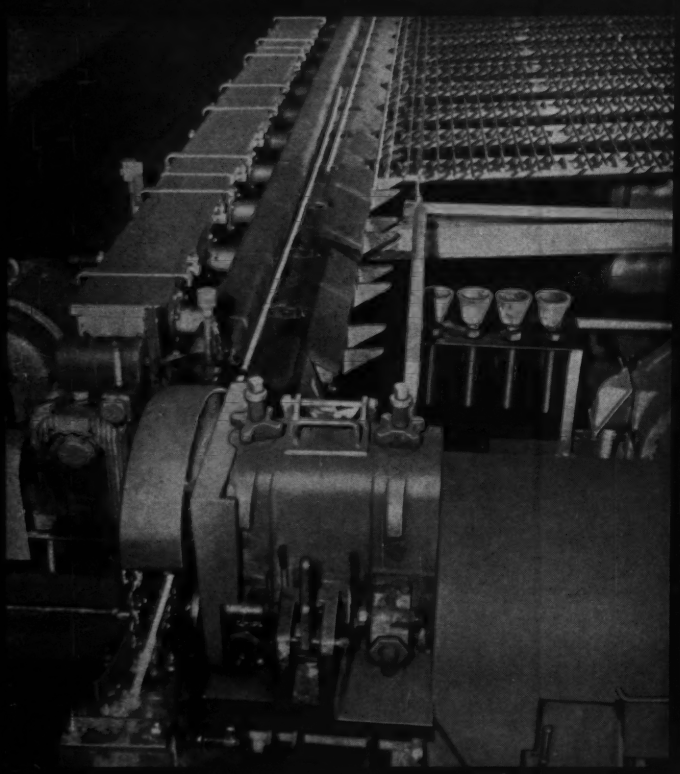
Electricity From Energy

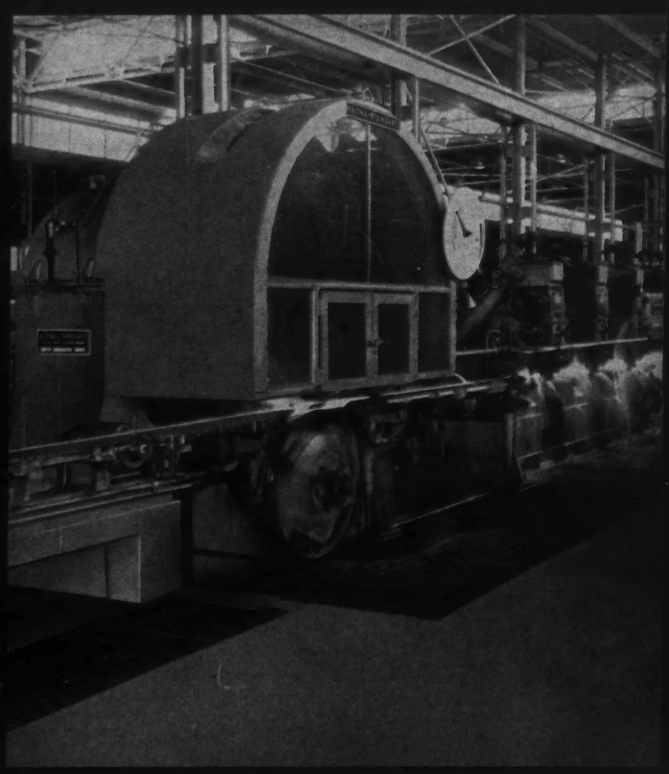
Radiation from a low-power reactor is being used to speed the direct conversion of kinetic energy into electricity. Here's how. Fission fragments are positively charged and endowed with 84 pct of the total energy released during a fission event. Collected on an insulated electrode, these tiny fragments build up ultrahigh voltages. Output exceeds several million volts.

2 REASONS... FOR

HIGH-SPEED PRODUCTION OF PIPE... (Small diameter)

by C. W. Mills, E. W. Mills, Seamless or Stretch Reducing





ROTARY KICKOUT

- Transfers pipe to Cooling Beds at high speeds.
- Simple mechanical design.
- No great gap required between pipe lengths.
- Pipes are staggered in Kickout and come to a complete rest in Kickout before being transferred onto the Cooling Bed.

ROTARY FLYING HOT SAW

- Cuts any desired length at close length tolerances.
- Length of cut can be changed at full mill speed.
- Runs continuously at high speeds.
- 24 Rotary Flying Saws in successful operation. Latest saw has been tested by actual running at speeds of 2000 F.P.M. and higher.

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OTHER FEATURES OF AETNA-STANDARD PIPE MILLS:

Stretch Reducing—Simple and rugged design allows fast changing of mill.

Cooling Beds—Screw type with Cooling Tanks. Automatic pipe handling for dividing of pipe and cropping if desired.

Uncoilers—Automatic handling of coils. No manual labor required.

Aetna-Standard Division

BLAW-KNOX

Unpatriotic?

Dear Sir—As a reader of The IRON AGE, I would like to comment on your editorials. Since your magazine is a technical magazine, why don't you stick to technical subjects in the editorials and leave politics out of it. When readers want politics, they know what magazines to read.

Besides, your criticism of our President is not very patriotic. When I am reading IRON AGE, I am not interested in your political beliefs. So please leave out the politics.—Bruno P. Plab, Pre-Development Corp., Denver, Colo.

Sacrifice for What?

▪ The following are just a few of the many comments concerning the editorial in the July 6 issue of The IRON AGE entitled "Sacrifice for What? And Besides, Who Says So?" —Ed.

Dear Sir—"In my humble opinion, this is an historical document and I wish that every elected representative of the people in the United States would read it."—Robert M. Sandberg, vice president, Columbia Tool Steel Co., Chicago Heights, Ill.

"I have been a consistent reader of IRON AGE for many years. I not only use your publication as a bible in our industry, but recently I always turn to the editorial page for your witty comments on domestic and world affairs. I think these editorials have been hard-hitting, straight-forward, and so truthful they hurt. I wish there were more men in industry who could take the time to talk and write the way you do. I think one of the best editorials you have written so far was in the July 6 issue."—Frank O. Putnick, vice president, Fischer-Fixman Metal Co., Inc., St. Louis, Mo.

"Your editorial in the July 6 issue is one of the most clearly stated summarizations of our present situations that I have seen over the past six months. I believe that in a few short words you have succinctly spelled out every shortcoming that we are experiencing from our so-called leaders in Washington."—Phillip H. Smith, director of purchasing and planning, LaSalle Steel Co., Chicago, Ill.

"Bravo for your editorial in the July 6 issue. Every sentence packs a wallop and states the truth. Would that our rapid-reading President could see this and slow down in the reading to the point where it would sink in."—Howard A. Taylor, Battle Creek Packaging Machines, Inc., Battle Creek, Mich.

"Your July 6 editorial is as hard-hitting as I've seen in a long time. It carries quite a sting—but accurate! A copy of the editorial is going to my Congressman. 'Little drops of water . . .' you know."—D. A. Watson, Metco, Inc., Westbury, N. Y.

"I am so impressed with the editorial in the July 6 issue that I would like to have a dozen reprints so that I can send them to our Congressmen and a few other 'politicos' who might benefit from reading it. This is by far the best exposition I have read of what is going on now. Tom Campbell is certainly to be congratulated for his clear and concise writing and thinking."—C. B. Kentnor, W. S. Rockwell Co., Fairfield, Conn.

U.K. Strikes

Dear Sir—In reference to the story on the International page of the July 6 issue entitled "U. K. Automakers Hit by Strikes," I know nothing of the reason for these strikes, or of the merits of any demands made by the workers. But I do know that the only trouble on my Jaguar automobile has been in the electrical equipment made by Smiths Motor Accessories, Ltd.—W. Metcalf, Sharon, Mass.

COATABLE CAPILLARY COLUMNS

To research chemists and process control engineers this term signifies a recent advance in gas chromatography—an advance made possible by the controlled interior finish and precise dimensions of stainless steel capillary tubing such as this 0.010" ID piece illustrated.

For you, this same manufacturing precision may spark other developments in varied fields. Posen & Kline produces Microdrawn® stainless steel and nickel alloy tubing up to 5/8" OD in every conceivable finish, shape, tolerance, and ID to solve difficult tubing problems . . . solve demanding needs with on-time deliveries

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—in building, communication, transportation, defense

and when you're producing stainless steels GLC ELECTRODES WILL LOWER MELT-TON COSTS

Our electrode customers are now reaping the benefits of advances we have made in graphite technology and manufacturing techniques.

Their melt-ton costs are being reduced by better all-round electrode performance which shortens furnace down-time, steps up production.

Our electrodes are of excellent quality—and our service technicians are swiftly on the job when wanted. You'll find it pays—and pays well—to specify GLC electrodes.

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Explosive Continent

South America is hot.

But this is more than just a weather report. This week Editor-in-Chief Tom Campbell makes another on-the-scene report on the business climate in South America (see story on p. 77).

This was Tom's eighth trip to Venezuela. And it was probably the roughest.

While staying at the Tamanaco Hotel, he heard a terrific noise from the parking lot outside the building. A bomb had exploded, completely destroying an automobile. Fortunately, no one was hurt.

"Symbolic" Bombing—Tom says it was a "symbolic" bombing, one of a series of such bombings that have occurred in Caracas. It's generally believed that this form of harrassment is the work of pro-Castro sympathizers and extreme leftists. Such terrorist activities are symbolic of the explosive situation in South America.

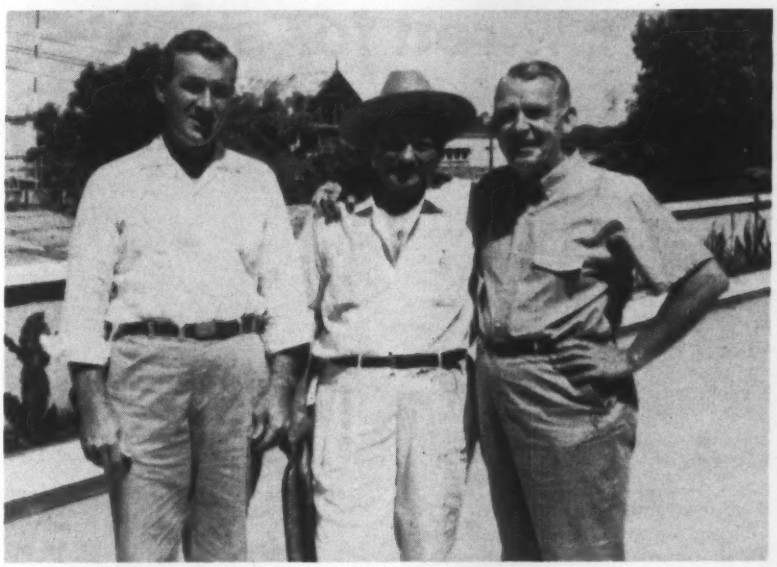
But to an old hand like Tom, events of this type are not totally unexpected. He has traveled Venezuela and reported on events there under two dictators and the present democracy of Romulo Betancourt.

On - the - Spot Interviews — His present story was written from Caracas and Ciudad Bolivar on the Orinoco River, in the savanna region of the country.

And his report is based on interviews with top government people, engineers, politicians, American business men, truck drivers, farmers, and others in this key country in the southern hemisphere.

These news contacts have been developed by Tom during his many previous trips to analyze South American business. The depth of this reporting is one of the reasons for the meaningful articles he turns out on business south of the U. S.

He calls Venezuela the "pilot plant" for the "new" democracy. What happens there will affect the trend in the rest of Latin America. It is an area undergoing significant change.



TIME TO TALK: During his most recent trip to South America IRON AGE Editor-in-Chief Tom Campbell talked with people in all stations of life from politicians and executives to farmers. Shown above at Ciudad Bolivar are (l. to r.) James Rieger, "Paco" Castillon, and Tom.

Straits Tin Report

Tin reduces wear—The addition of up to 0.1% tin has a marked effect in eliminating ferrite from the matrix of both gray and nodular irons, producing a wear-resistant fully pearlitic matrix.

Effect of tin on pearlite in microstructure of hypo-eutectic cast iron bar, 1.2-in. dia.

The amount of tin added to cast iron sections up to 3 in. thick is not critical. A reasonable excess does not produce any massive cementite or affect mechanical properties.

Organic compounds of tin stabilize vinyl chloride polymers to inhibit color at high temperature and to protect against decomposition during processing and degradation in service.

Low linear contraction is a property of high tin content die-casting alloys. Tin alloys shrink very little, permitting close tolerances and very thin walls in such typical small castings as pinions, numbering machine wheels, dashpots of electrical instruments, and gas meter grid valves.

FREE Bulletin

Write today for a free subscription to TIN NEWS—a monthly bulletin on tin supply, prices and new uses.

The Malayan Tin Bureau

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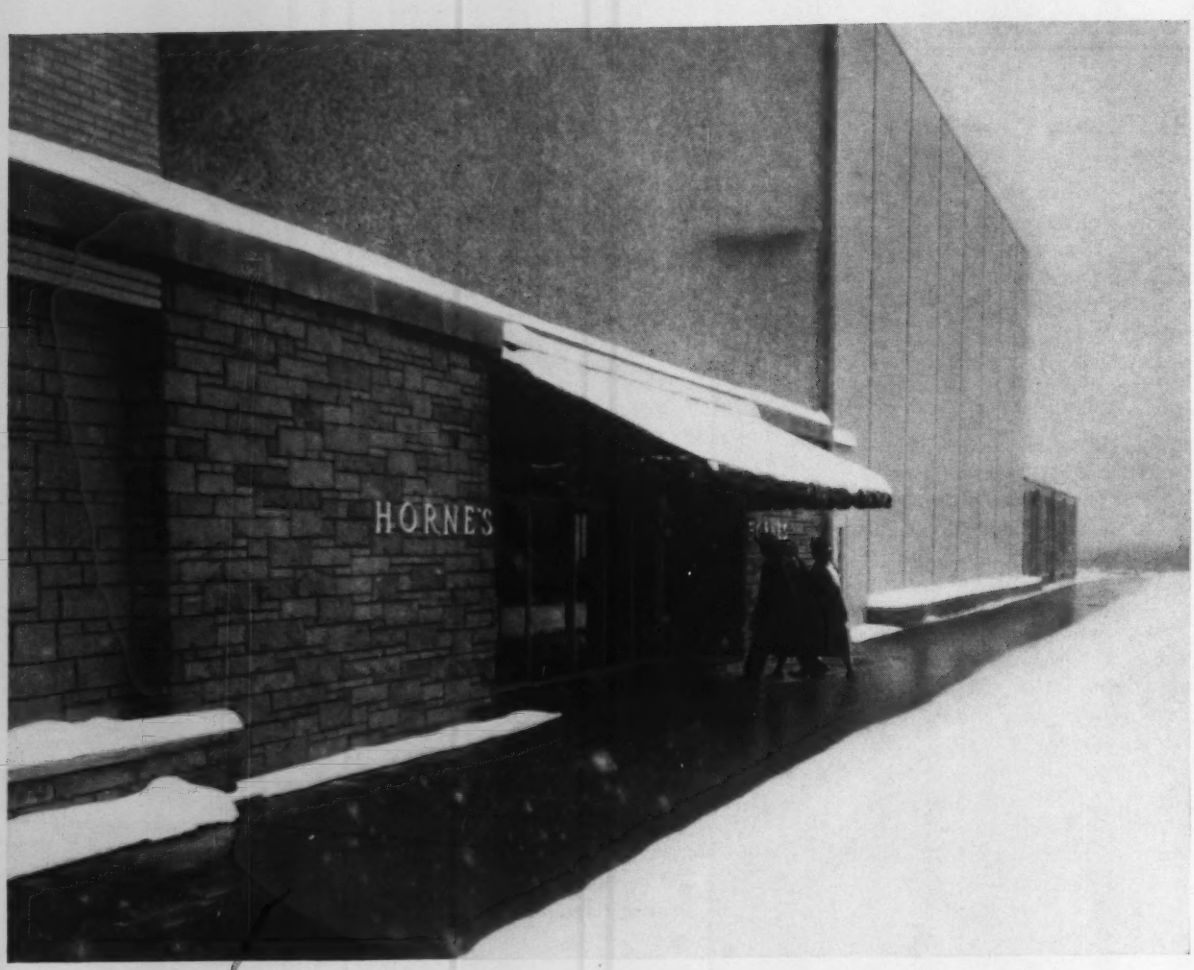

This sidewalk is wired for snow

Nickel alloy electric heating cables in the concrete melt snow as fast as it falls!

No shoveling, no salting, no customer accidents on slippery sidewalks at *this* suburban branch of a Pittsburgh department store. Electric heating cables keep the sidewalks clear of snow and ice during even the worst winter weather.

Saves maintenance costs. In addition to taking the bother out of blizzards, the system eliminates the cost of conventional sidewalk clearance. And further savings are realized because the heating cables—made of 80% Nickel—require no maintenance.

High Nickel alloy cables were used because of Nickel's superior resistance to corrosion, fatigue and extreme temperatures. These Nickel alloy cables will withstand years of repeated heating and cooling, and seasonal expansion and contraction of the concrete.

Just one example of Nickel's versatility. Electric heating cables—also used to melt snow and ice from roofs and driveways—is another example of how Nickel helps make possible new products and processes, and improves existing ones. In most any application, Nickel's wide range of important properties . . . corrosion resistance, strength, long life and beauty, to name just a few . . . offers proven advantages.

If your business is metals, or if you use metals in your business, call on Inco for the latest information about how Nickel and its alloys can help you.

Imbedded near the concrete surface, electric heating cables of 80% Nickel keep the sidewalks clear of snow and ice. Cables made by Edwin L. Wiegand Company, Pittsburgh.

THE INTERNATIONAL NICKEL COMPANY, INC.

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INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

COMING EXHIBITS

Plastics Materials Show—Applications Clinic, August 15-16, Santa Monica Civic Auditorium, Santa Monica, California.

National Chemical Show—Sept. 5-8, International Amphitheatre, Chicago. (Chicago Section, American Chemical Society, 86 E. Randolph St., Chicago 1.)

Industrial Building Exposition—Sept. 25-28, New York Coliseum.

Detroit Metal Show—October 23-27, Cobo Hall, American Society for Metals.

MEETINGS

AUGUST

American Astronautical Society—Fourth western regional meeting, August 1-3, Sheraton-Palace Hotel, San Francisco.

Personnel Management Conference—Cornell University's New York state School of Industrial and Labor Relations, August 1-4, Ithaca, New York.

American Institute of Electrical Engineers — Pacific general meeting, August 23-25, Hotel Utah, Salt Lake City, Utah.

Metallurgical Society of AIME—Semiconductors conference, Aug. 30-Sept. 1, Ambassador Hotel, Los Angeles. Society headquarters, 29 W. 39th St., New York.

SEPTEMBER

Air Moving and Conditioning Assn., Inc.—Annual meeting, Sept. 10-14, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, Guardian Bldg., Detroit.

International Industrial Conference — Sept. 11-13, Masonic Memorial Auditorium, San Francisco.

(Continued on P. 24)

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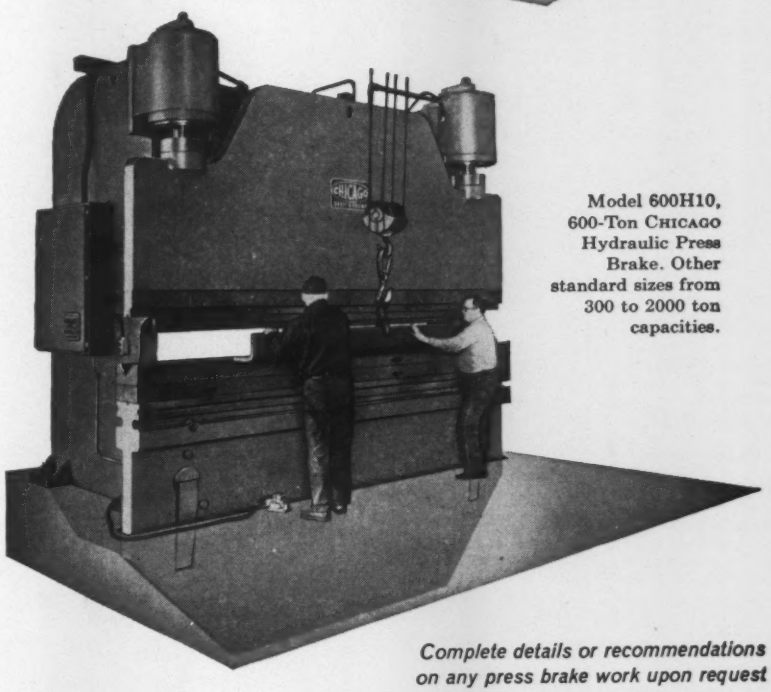
unexcelled accuracy / ***for sheet metal and plate work***

Model 410D, 90-Ton CHICAGO Mechanical Press Brake. Other standard sizes from 11 to 450 ton capacities.



Model 600H10, 600-Ton CHICAGO Hydraulic Press Brake. Other standard sizes from 300 to 2000 ton capacities.

Complete details or recommendations on any press brake work upon request

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Press Brakes
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Straight-Side-Type Presses
Hand and Power Bending Brakes
Special Forming Machines

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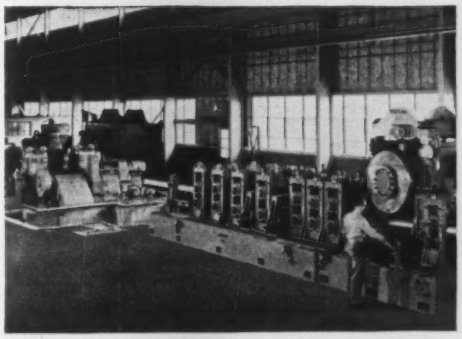
Federal Welding Line at Whirlpool's Evansville, Indiana, refrigerator plant automatically forms and welds together complete food liner shells at a rate of 200 per hour. Here, F. A. Bodenheim, Jr., manager of welder sales for McKay's Federal-Warco Division, goes over latest production charts with H. J. Muehlbauer, director of manufacturing engineering for Whirlpool, as Robert Bussell, sales representative for Federal-Warco, discusses operations with Gene Rommel, general superintendent of tooling for Whirlpool.

Photo by ARNOLD NEWMAN

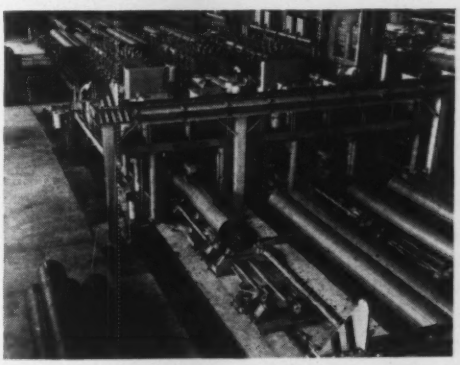
A completely integrated plant . . . a single source of supply . . . one area of responsibility! A new idea? Not really, but an idea that's not easy to bring to reality. McKay Machine has done it for metal fabricators, designing and building equipment to volume produce parts or entire units from raw steel to finished product. ***This is McKay Machine*** We know steel handling . . . we've been designing uncoilers and coil-handling equipment for 30 years. McKay Machine knows welding because the highly respected names of Federal Welder and Berkeley-Davis are now a part of our company. We know processing and forming . . . McKay levelers, tube mills, and cold roll forming machines have been specified by leading industrial firms for more than two decades. And McKay Machine knows stamping, as the Warco Press name testifies. McKay builds the industry's most popular shearing and slitting equipment. Only McKay Machine designs and builds all the components for a truly integrated production line. If you are one of the hundreds of manufacturers who must shave production and handling costs to successfully compete, McKay Machine should interest you. If we do, let us know and we'll meet with you at your convenience. *The McKay Machine Company, Youngstown 1, Ohio.*

McKAY MACHINE



McKay Tube Mills and roll forming machines are considered among the best engineered in the world.

Warco Presses can be found in the leading automotive, appliance and aircraft plants . . . wherever stamping is a major operation.



Berkeley-Davis Fusion Welding Lines, such as the huge installation above, are used by an ever-increasing number of leading steel fabricators.

A demonstration of WHEELABRATOR'S

VITAL VALUES

A minimum of three chemical analyses is performed on each heat of Wheelabrator Steel Shot to assure conformity to rigid chemical standards. Detailed laboratory analysis of microstructure further assures product uniformity.

Wheelabrator steel shot® consistent quality controls cleaning costs

To achieve a uniform finish in blast cleaning operations, at a relatively constant and predictable cost, and at uniform production rates, the abrasive used must be of uniform hardness and quality. Wheelabrator Steel Shot gives you this uniformity, from box to box and shipment to shipment. Its hardness, chemical analysis, microstructure and density are carefully maintained by close production controls and detailed laboratory analysis. Wheelabrator Steel Shot gives you the Vital Values of uniform cleaning results, uniformly fast cleaning speeds, reduced maintenance of your blast equipment, and uniformly low cleaning costs. Get the complete story in our Handbook of Blast Cleaning Abrasive Performance.

VITAL VALUES FOR INDUSTRY

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STEEL ABRASIVES

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In Canada, WHEELABRATOR CORP. of Canada, Ltd. P.O. Box 490, Scarborough, Ont.

MEETINGS

(Continued from P. 21)

Society of Plastic Engineers, Inc. —Regional Technical Conference, Sept. 12, Central Indiana Section, Severin Hotel, Indianapolis.

Non-Ferrous Founders' Society—Annual meeting, Sept. 17-21, Shawnee Inn, Shawnee-on-the-Delaware, Pa. Society headquarters, University Bldg., 1604 Chicago Ave., Evanston, Ill.

AEC Welding Forum — Annual meeting (classified), Sept. 20-22, Southwest Research Institute. Institute headquarters, Granada Hotel, San Antonio, Texas.

Industrial Electronics Symposium —Sept. 21-22, Bradford Hotel, Boston. Institute headquarters, 51 East 42nd Street, New York 17.

Pressed Metal Institute — Annual meeting, Sept. 24-28, The Grand Hotel, Point Clear, Ala. Institute headquarters, 3673 Lee Rd., Cleveland.

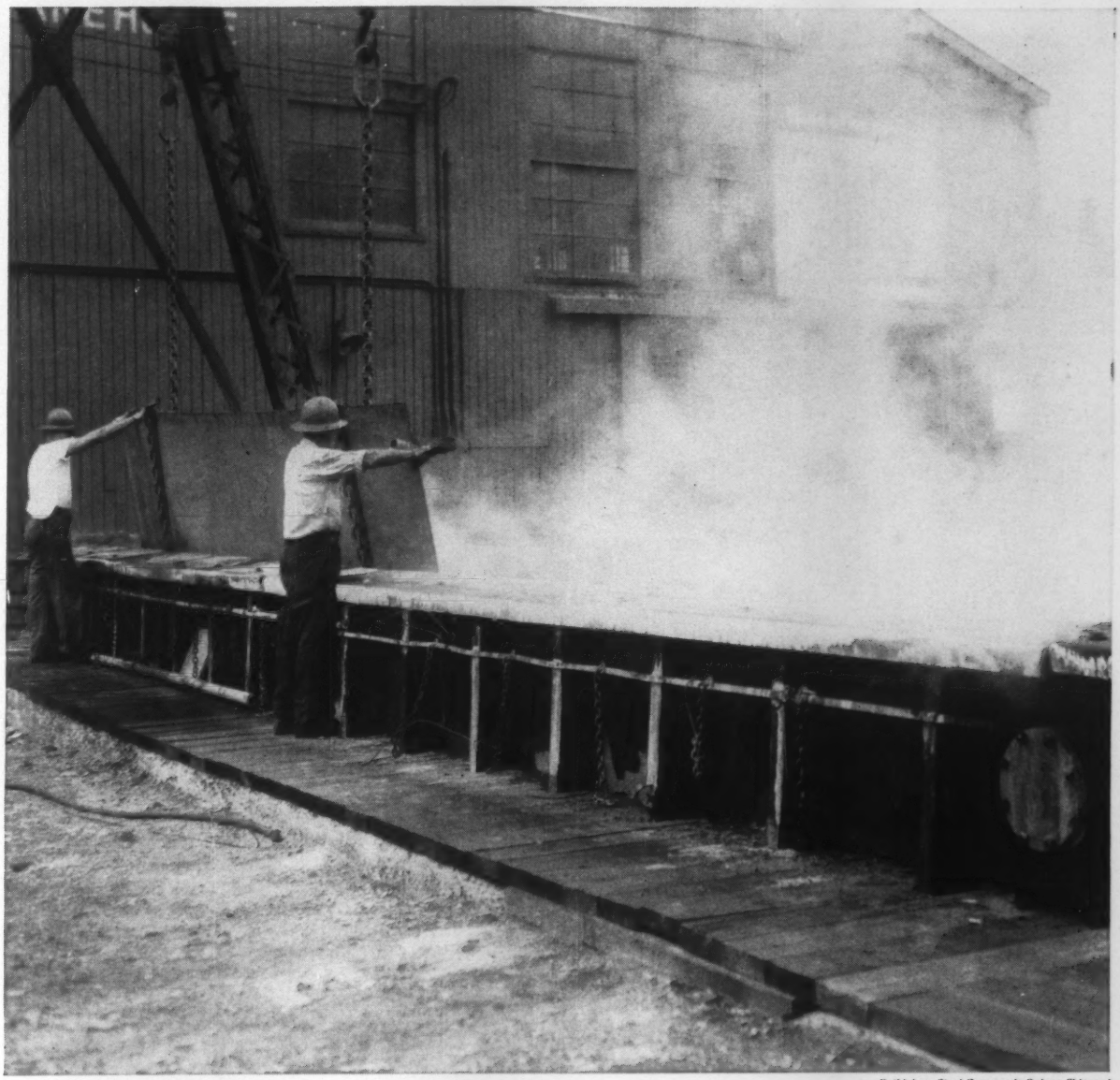
American Welding Society — Fall meeting, Sept. 25-28, Adolphus Hotel, Dallas, Texas. Society headquarters, 33 W. 29th St., New York.

Assn. of Iron and Steel Engineers —Annual convention, Sept. 25-28, Penn-Sheraton Hotel, Pittsburgh. Assn. headquarters, 1010 Empire Bldg., Pittsburgh.

American Die Casting Institute Inc. and The Die Casting Research Foundation—Annual meeting, Sept. 27-28, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

American Production and Inventory Control Society—Annual national conference and technical exhibit, Sept. 28-29, Pick-Congress Hotel, Chicago. Society headquarters, 330 S. Wells St., Chicago 6.

Purchasing Agents Assn. — 14th Pacific Inter-Mountain Conference, Sept. 29-30, Westward Ho Hotel, Phoenix, Arizona.



Bethlehem Steel Company's Quincy Shipyard

Hot acid meets its match

THAT'S armor plate, soon to be part of a new ship, being plunged into a 26-year-old tank of hot acid. This job of pickling steel used to be dangerous and costly because the only tanks that could hold the acid without corrosion were masonry or wood. And they leaked.

A leakproof tank seemed impossible until B.F.Goodrich engineers came up with a protective lining for metal tanks. The B.F.Goodrich Triflex lining is a combination of hard rubber sandwiched between soft rubber that stands the most corrosive acids. The lining is permanently bonded to the steel tank. And for this job, it was protected from excessive heat and accidental gouges by a sheathing of brick.

The 42-foot tank shown above was lined by this method in 1935. Since then it's been in almost constant use, except for some downtime in 1947.

Good as this service life is, we don't claim it's a record-breaker. Some tanks lined by B.F.Goodrich 37 years ago are still in use today. Many have lasted 20 to 30 years. Not one has ever failed to put an end to costly leaks, high maintenance costs, danger to workmen. If you'd like more information about BFG's abilities and facilities for rubber lining, write *B.F.Goodrich Industrial Products Co., Dept. M-169, Akron 18, Ohio.*

B.F.Goodrich

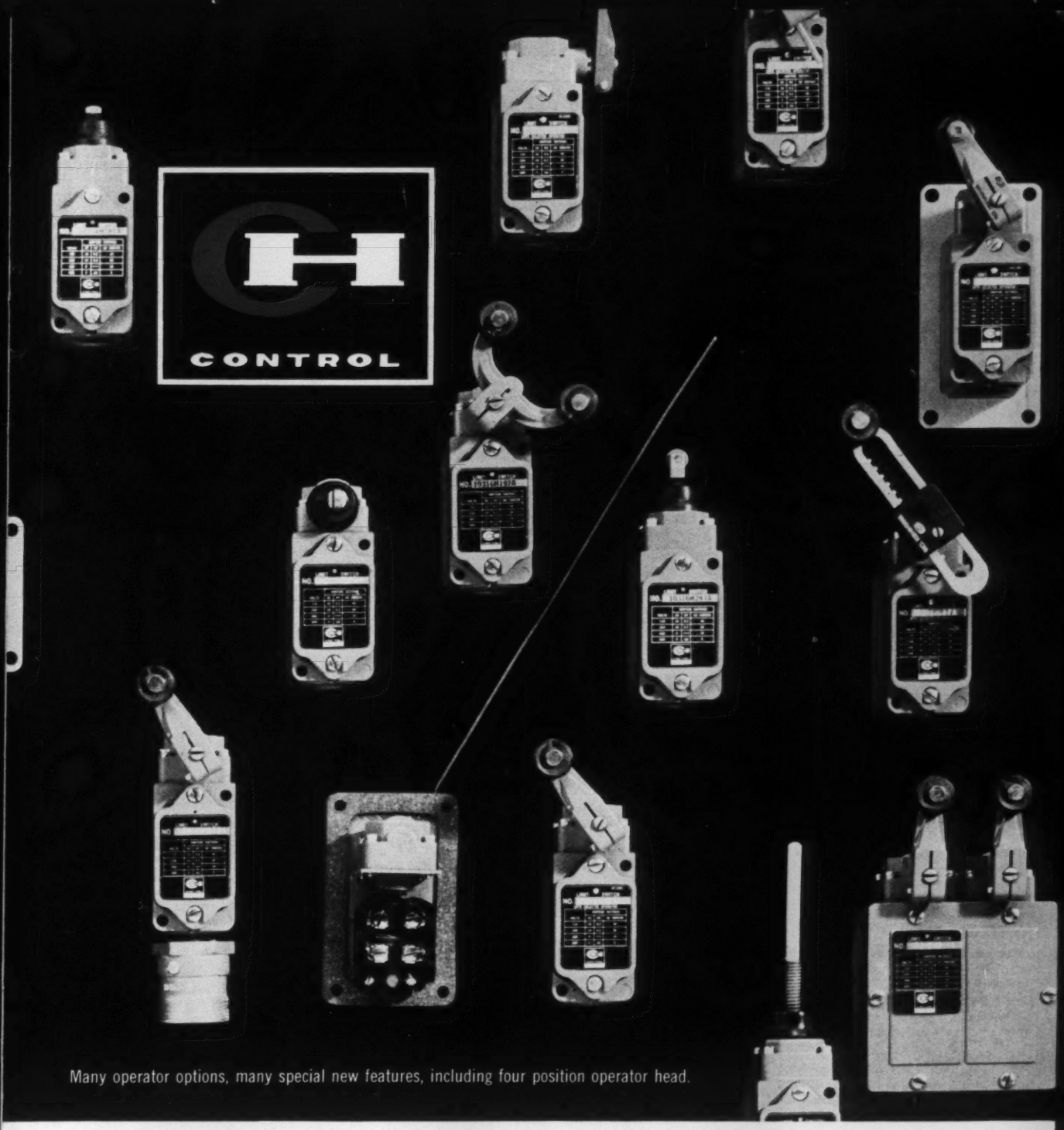
TANK LININGS

What's your problem? If you can solve it with a

New Cutler-Hammer operator options provide top flexibility... world's best oiltight limit switch

For any use, anywhere, in any position . . . you just can't buy a more reliable, longer-life switch. No other switch is sealed more effectively . . . effectiveness we've proved under test conditions so rugged they will never be equaled in actual service. Even the silver-to-silver contacts are visible for quick inspection. For full details on this complete new line, write for Pub. ED-145-N246.

For any electrical control problem, contact your local Cutler-Hammer sales office or distributor. They'll supply you with the finest electrical components, the finest service and technical help.



Many operator options, many special new features, including four position operator head.

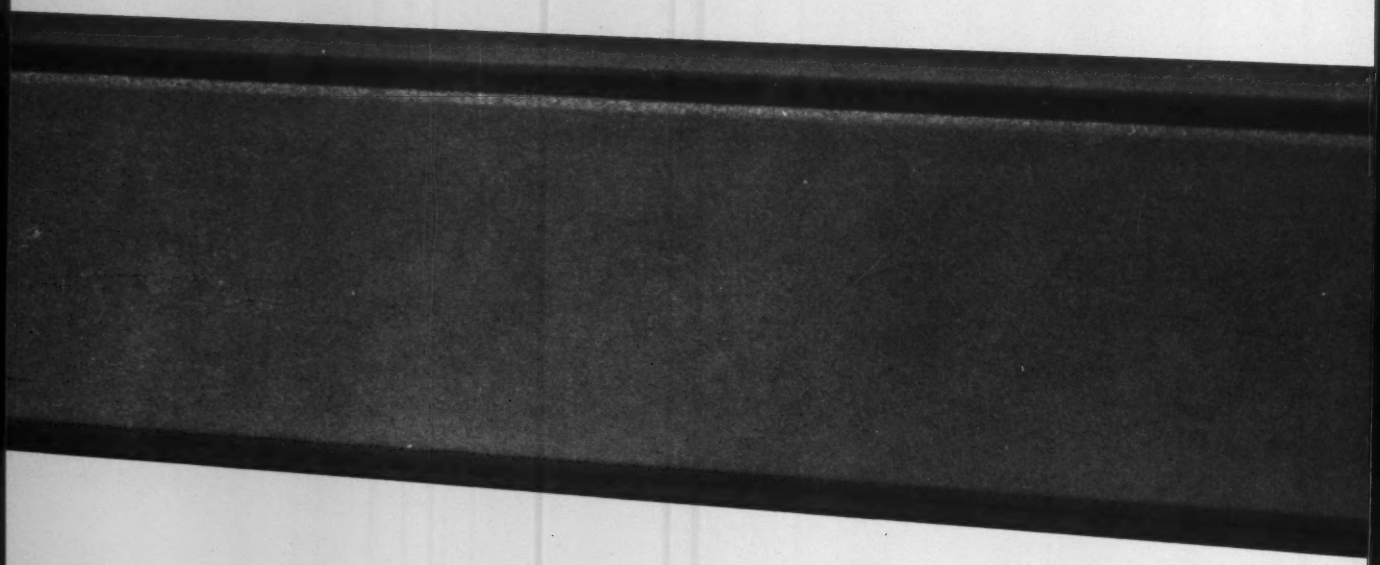
limit switch, your best answer's here!

WHAT'S NEW? ASK...

CUTLER-HAMMER

CONTROL

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. • Associates: Cutler-Hammer Canada, Ltd.; Cutler-Hammer Mexicana, S. A.



National Tube Division
United States Steel Corporation
525 William Penn Place
Pittsburgh 30, Pennsylvania

Please send me complete information about
USS National Hot-Rolled Carbon Steel
Hollow Structural Tubing.

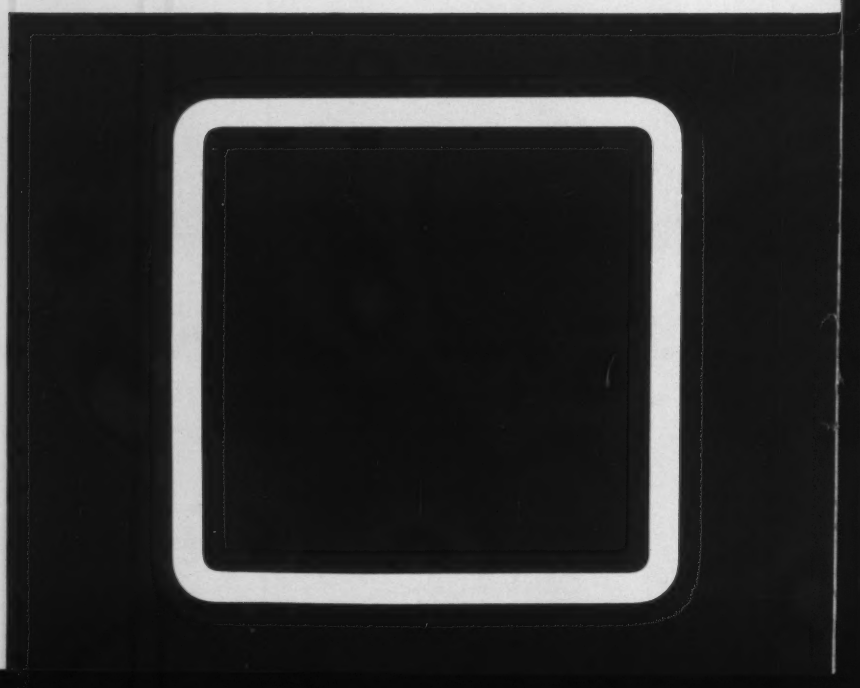
Name_____

Company_____

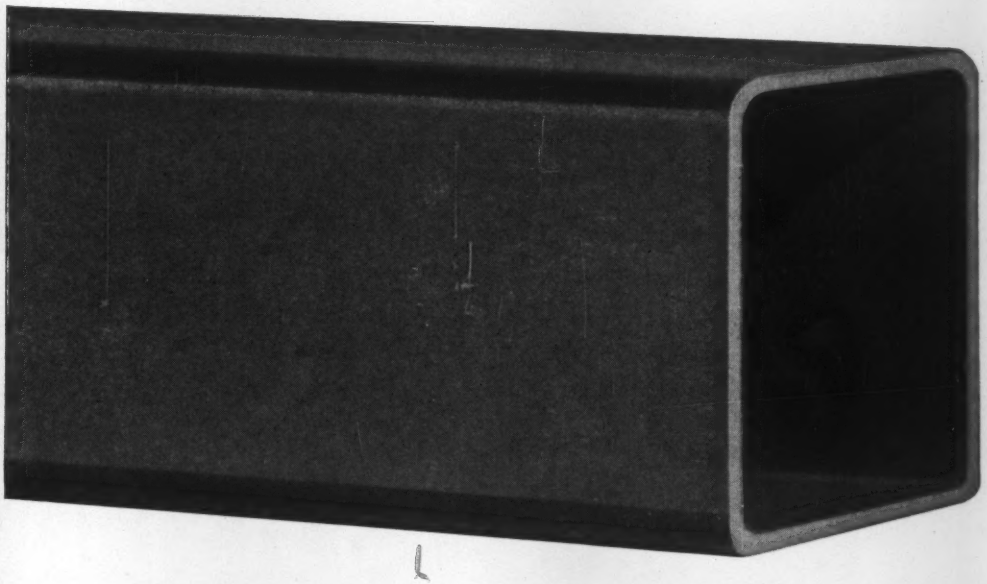
Address_____

City_____ Zone____ State_____

This mark tells you a product
is made of modern, dependable Steel.



The shape for things to come ...in structural steel



Add low-cost **USS National Hollow Structural Tubing** to the list of available structural sections.

USS National Hollow Structural Tubing is made of hot-rolled carbon steel. This product has a tensile strength of up to 80,000 psi, and a minimum yield strength of 33,000 or 36,000 psi—maximum strength at minimum cost. It conforms to the chemical and mechanical properties of ASTM A-7 and A-36 specifications. Because of the hollow design, you obtain maximum strength with minimum weight. It's compact, easy to handle and maintain. It is a highly efficient structural member especially in compression and where subjected to bending moments in more than one direction.

USS National Hollow Structural Tubing comes in a wide range of stock sizes: 1″ x 1″ to 10″ x 10″ for squares, up to 32″ perimeter for rectangles, and in lengths 36 to 42 feet. For more detailed information, send the coupon.

USS and National are registered trademarks

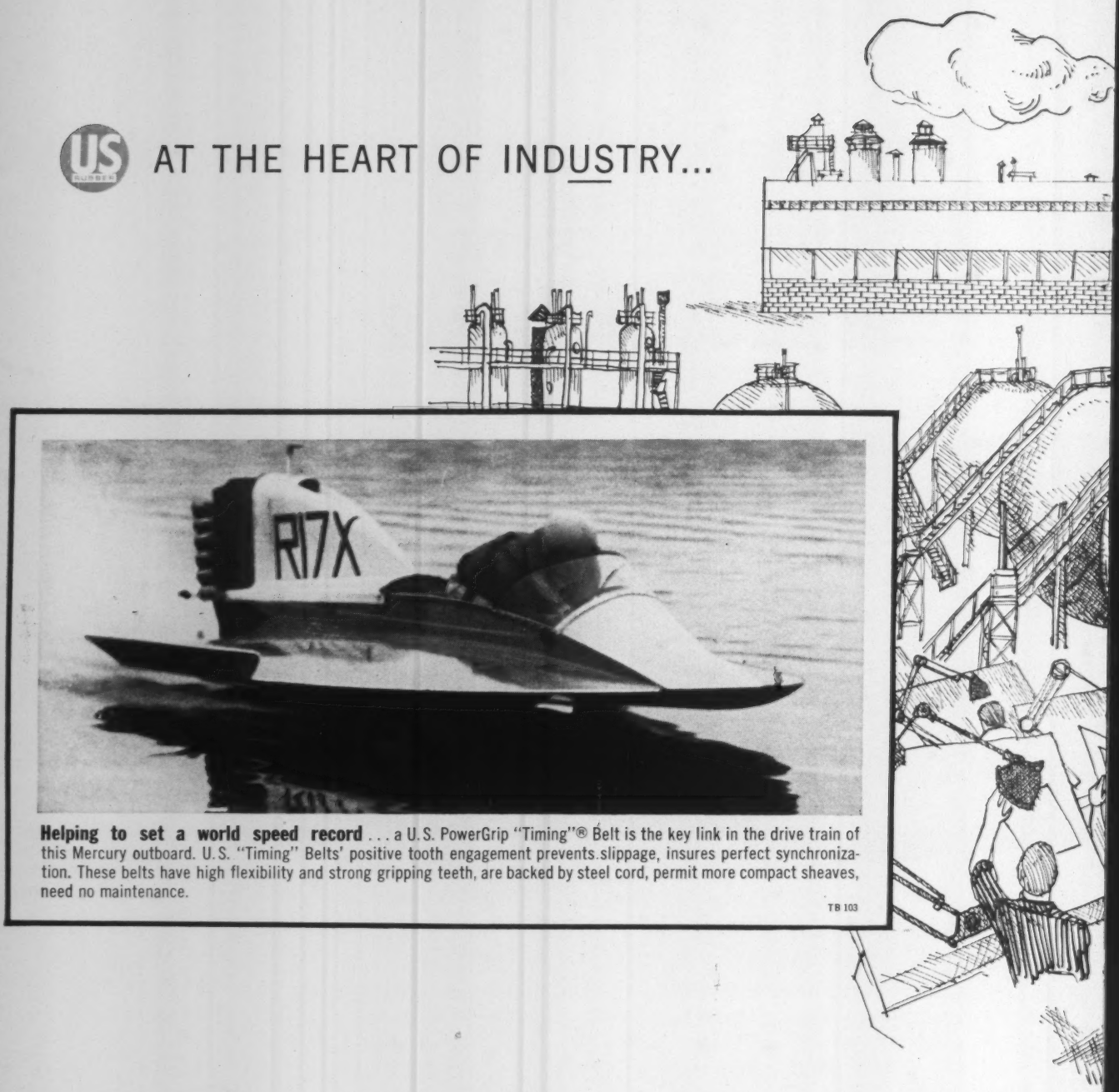
USS

National Tube Division of United States Steel

US AT THE HEART OF INDUSTRY...

Helping to set a world speed record . . . a U.S. PowerGrip "Timing"® Belt is the key link in the drive train of this Mercury outboard. U.S. "Timing" Belts' positive tooth engagement prevents slippage, insures perfect synchronization. These belts have high flexibility and strong gripping teeth, are backed by steel cord, permit more compact sheaves, need no maintenance.

TB 103



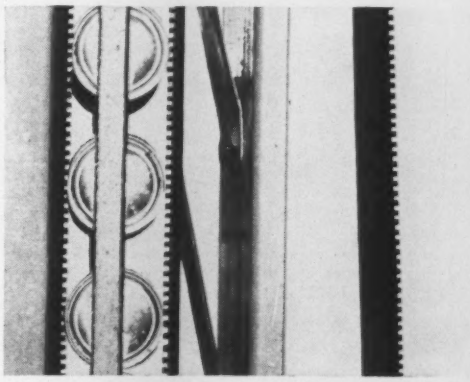
Wherever the design and production of power equipment is involved, you'll find US Industrial Rubber Products...helping to simplify the design, improving the efficiency and reliability of equipment both new and old, adding to the profit of manufacturer and operator alike.

Chosen for overall top performance, U. S. Royal V-Belts drive the edger blade on Western Tool & Stamping Company's powerful Edger-trimmer. These belts must withstand oil, dust, weather, and twisting. They must also deliver top performance at many different engine speeds. U.S. Royal V-Belts do the job . . . were chosen because they outperformed all competitive belts.

VB 104

Providing better steering control for Clarke's new Power Sweeper, a U.S. PowerGrip Flexible Coupling has eliminated cumbersome, costly metal parts and their need for lubrication . . . provides quieter, cushioned, yet responsive steering. These easily installed couplings not only compensate for lateral and axial misalignment, but reduce vibration and absorb jarring shocks.

FC 103



"Nothing short of spectacular," says an Anheuser-Busch brewery manager about two U. S. SteepGrade Conveyor Belts that lift wet 16-oz. beer cans at a 90° angle. The secret of this non-slip operation is SteepGrade's "gripper cleat" construction which holds the cans firmly, yet gently, allows less pressure and belt speed, eliminates damage to cans and smearing of print.

CB 124

For every industrial rubber product need, turn to US. For Conveyor Belts, V-Belts, the original PowerGrip "Timing"® Belt, Flexible Couplings, Mountings, Fenders, Hose and Packings . . . custom-designed rubber products of every description. Discover why U.S. Rubber has become the largest developer and producer of industrial rubber products in the world. See your U.S. Rubber Distributor or contact US directly at Rockefeller Center, New York 20, N. Y.

WORLD'S LARGEST MANUFACTURER
OF INDUSTRIAL RUBBER PRODUCTS

US RUBBER

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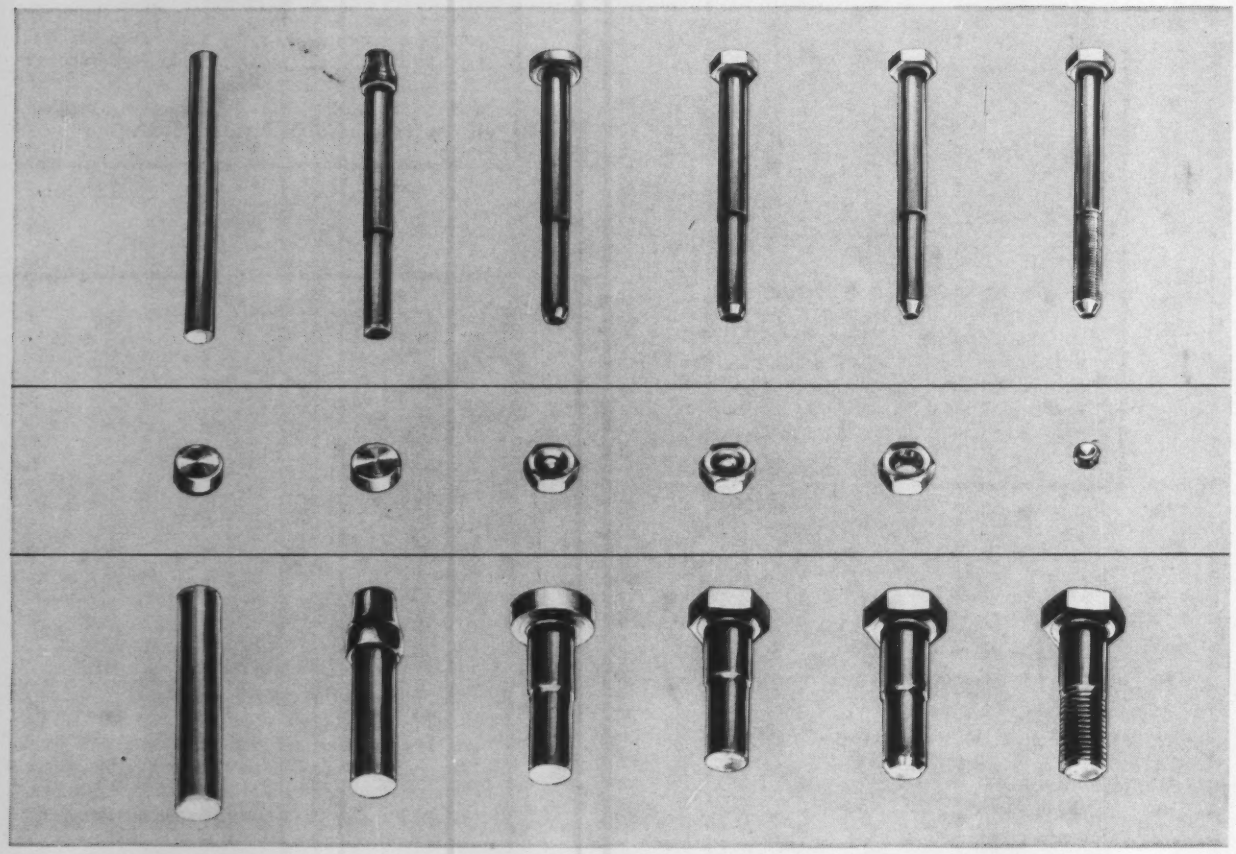
MECHANICAL GOODS DIVISION

Take a lead from the leaders...

AMCHEM GRANODRAW* ZINC TOOL LIFE SUBSTANTIALLY



Typical stages involved in a sample of R, B&W's quality fastener products. Upper row, ½" hex automotive screws; middle row, ¼" hex nuts; bottom row, ¾" screws—all phosphate coated with Amchem Granodraw.

PHOSPHATE COATINGS INCREASE AT RUSSELL, BURDSALL & WARD!

R, B&W producing parts not possible without the use of phosphate coating and lubricant

At the Port Chester, N. Y. plant of Russell, Burdsall & Ward Bolt and Nut Company the use of Amchem Granodraw zinc phosphate coatings are facilitating new, unique and difficult forming jobs in cold headed steel fastener manufacture.

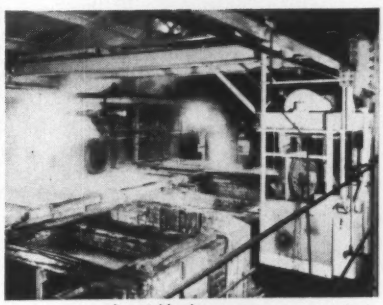
With many thousand different kinds and sizes of nuts, bolts, screws and cold-headed parts being produced in a straight-line operation, R, B&W demands top quality in phosphate coating and lubrication, gets it in Granodraw and Granolube. The results —extra tool life and tool cost savings. Says one R, B&W product engineering official, "phosphate coating has increased our tool life substantially."

Significantly, in operations involving heavier extrusion and severe upsetting, Granodraw has created a flexibility that permits R, B&W to produce parts impossible to make without phosphate coating.

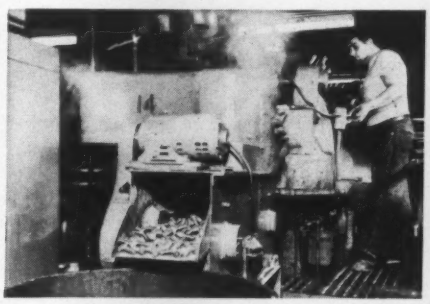
Granodraw produces a trouble-free, uniform coating that remains on the wire through all deforming operations, and still shows on the finished product. Its efficient coating has had a marked effect on machine performance that translates into greater production, fills R, B&W requirements for high volume output.

Consider Granodraw for your operation if you draw, extrude or cold form metals. Its many advantages can save you time, extend tool life and reduce equipment cost, help produce a finer finished product. Get the details from a metal finishing specialist —your local Amchem Representative.

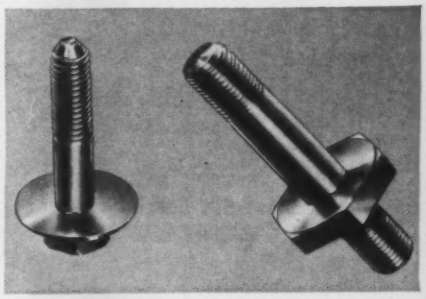
*Amchem's registered trademark for its zinc phosphate coating for steel surfaces.
**Amchem's registered trademark for its pickling acid inhibitor.



In pickle house, crane operator lifts stem-load of rod from Granodraw tank. Note how steam and fumes are confined to bath area through use of Amchem Rodine** pickling acid inhibitor.



Typical of R,B&W's impressive production facilities is the operation of one of their large bolt-makers.



Difficult parts possible because of Granodraw include a hex washer head screw on the left and a 5/16" special stud with a 1 3/8" dia. hex upset collar on right.

AMCHEM **GRANODRAW**

Amchem and Granolube are registered trademarks of **AMCHEM PRODUCTS, INC.** (Formerly American Chemical Paint Co.)
Detroit, Mich. • St. Joseph, Mo. • **AMBLER, PA.** • Niles, Calif. • Windsor, Ont.

If there's a road near you, any steel in a hurry from

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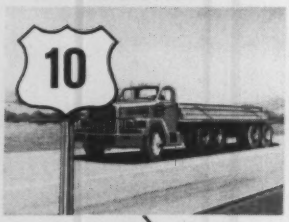
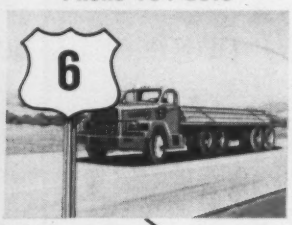
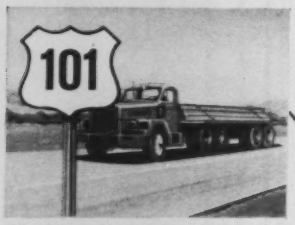
Seattle Service Center
MAin 3-3014



Moline Service Center
Phone 764-5616

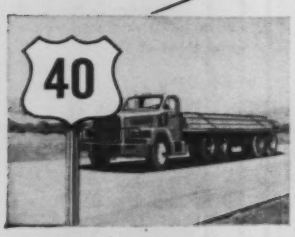


Twin Cities Serv. Center
MIdway 6-7311

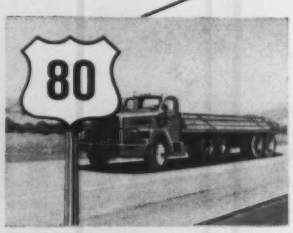


San Francisco Serv. Center
MA 1-4988 EN 1-0017

Los Angeles Service Center
LUdlow 5-0101



St. Louis Service Center
JEfferson 5-0440



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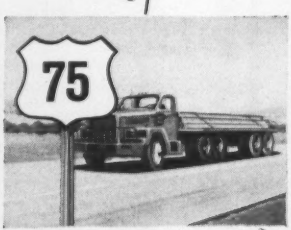
WH 3-7356 CR 5-2747

U. S. Steel Supply
Division of
United States Steel

USS
TRADEMARK

General Office:
208 S. LaSalle St., Chicago 4, Ill.



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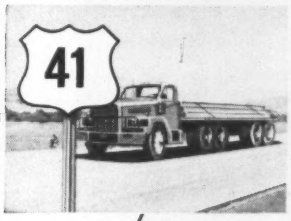
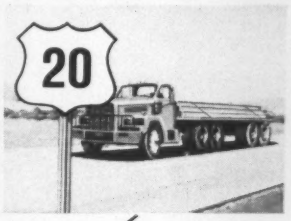
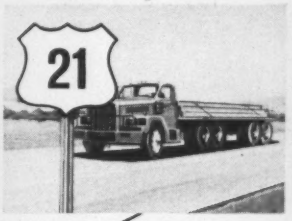


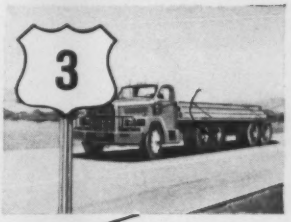
Chicago Service Center
MItchell 6-3211

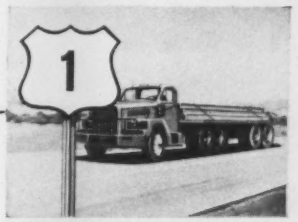


Cleveland Service Center
BRoadway 1-5000



Boston Service Center
STadium 2-9400





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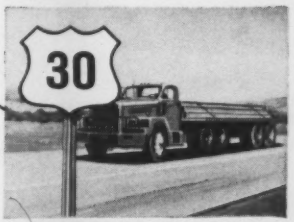

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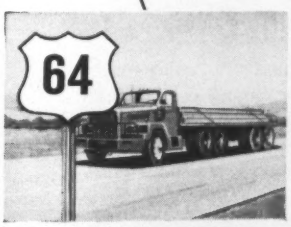

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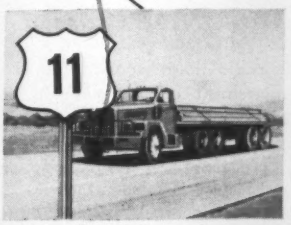
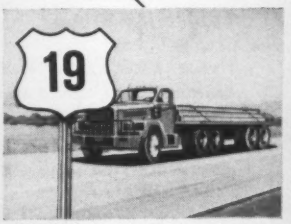
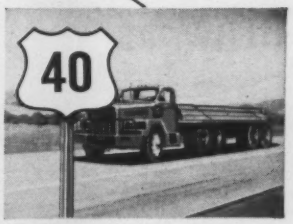
WHitehall 8-6741



Birmingham Service Center
STate 7-9611



Pittsburgh Service Center
FAirfax 2-4200



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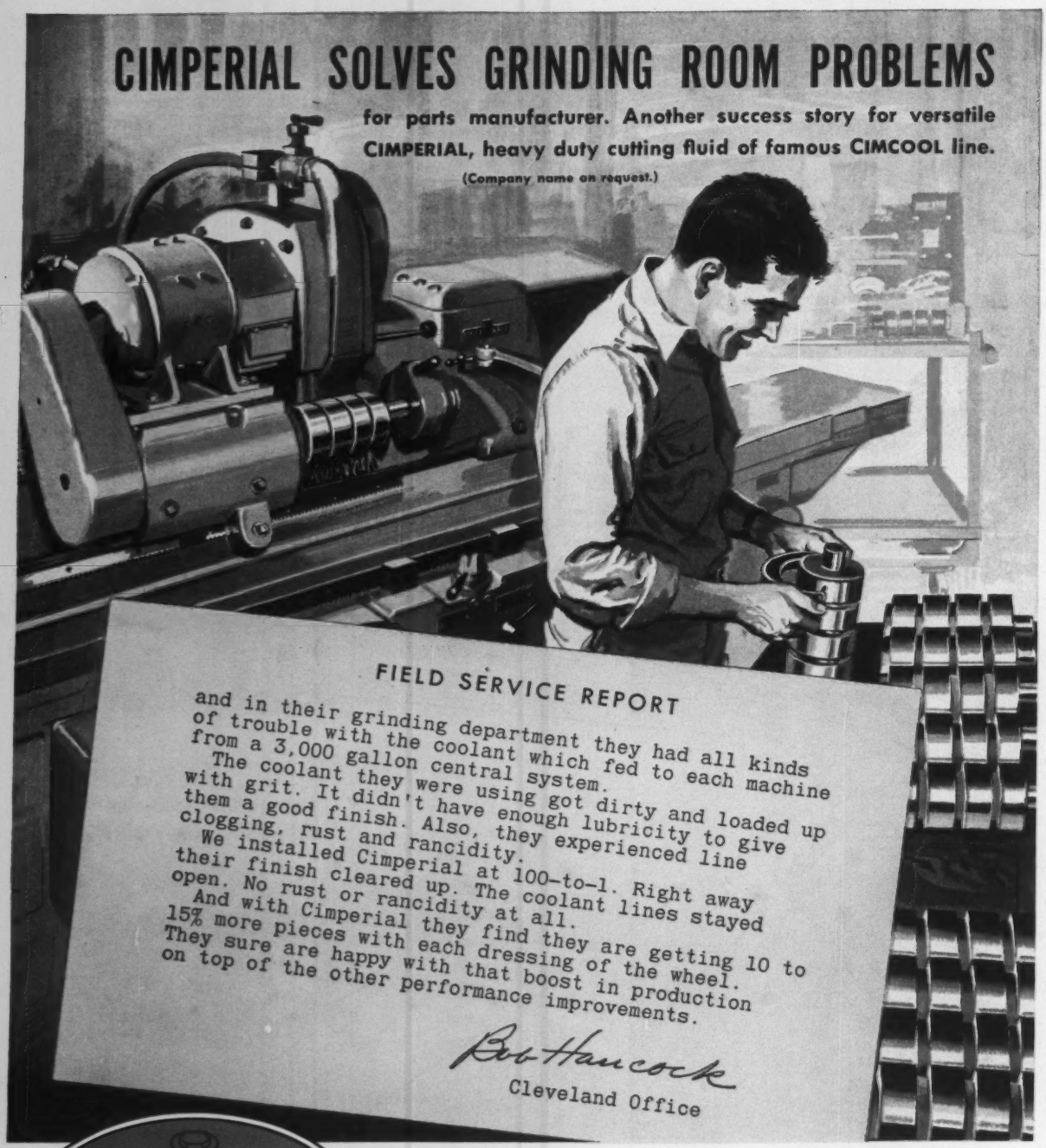
CIMPERIAL SOLVES GRINDING ROOM PROBLEMS

for parts manufacturer. Another success story for versatile CIMPERIAL, heavy duty cutting fluid of famous CIMCOOL line.

(Company name on request.)



FIELD SERVICE REPORT

and in their grinding department they had all kinds of trouble with the coolant which fed to each machine from a 3,000 gallon central system.

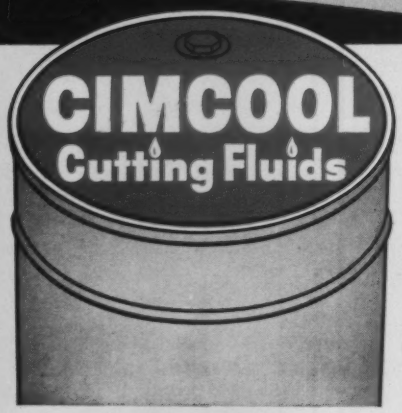
The coolant they were using got dirty and loaded up with grit. It didn't have enough lubricity to give them a good finish. Also, they experienced line clogging, rust and rancidity.

We installed Cimperial at 100-to-1. Right away their finish cleared up. The coolant lines stayed open. No rust or rancidity at all.

And with Cimperial they find they are getting 10 to 15% more pieces with each dressing of the wheel. They sure are happy with that boost in production on top of the other performance improvements.

Bob Hancock

Cleveland Office



FOR 100% OF ALL METAL CUTTING JOBS

Production-Proved products of The Cincinnati Milling Machine Co.

FIVE-STAR CIMCOOL—Newest in the industry-proven line of CIMCOOL° Cutting Fluids.
CIMPERIAL° — Heavy duty replacement for cutting oils in those low-speed tough jobs.
CIMPLUS — The transparent grinding fluid which provides exceptional rust control.
CIMCUT Concentrates (AA, NC, SS) — For every job requiring an oil-base cutting fluid.
ALSO—CIMCOOL Tapping Compound—CIMCOOL Bactericide—CIMCOOL Machine Cleaner.

For full information on the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor. Or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

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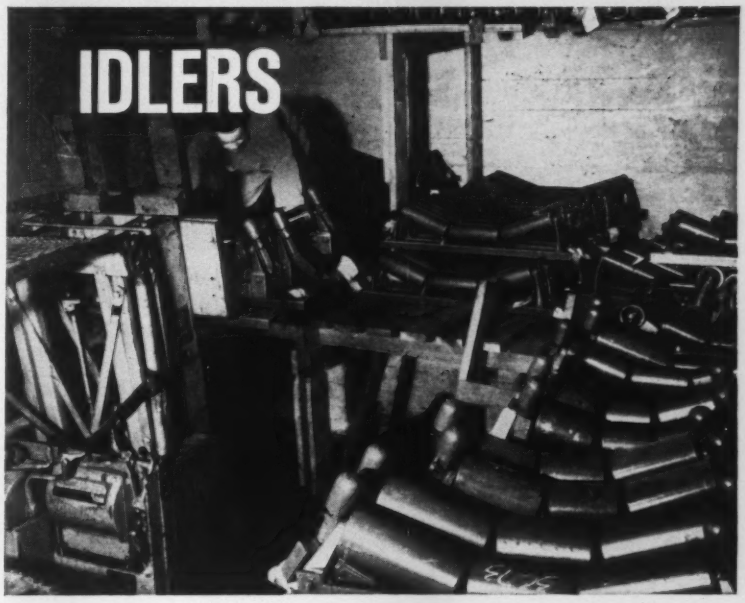
THE BROAD H-R LINE

fast delivery
technical service
local stock



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He is part of a stock-carrying distributor network stretching from Coast-to-Coast, backed by Hewitt-Robins warehouses and sales offices. At his fingertips is one of the widest lines of conveyor belt and idlers available in industry. At his command is technical information that could come only from a company that makes *both* components. Hewitt-Robins stands alone as a manufacturer of conveyor machinery *and* conveyor belting. This fact also assures you of highest quality and single-source responsibility. Hewitt-Robins, Stamford, Connecticut.

Write for bulletins
7-62 (Belt)
7-62 (Idlers)

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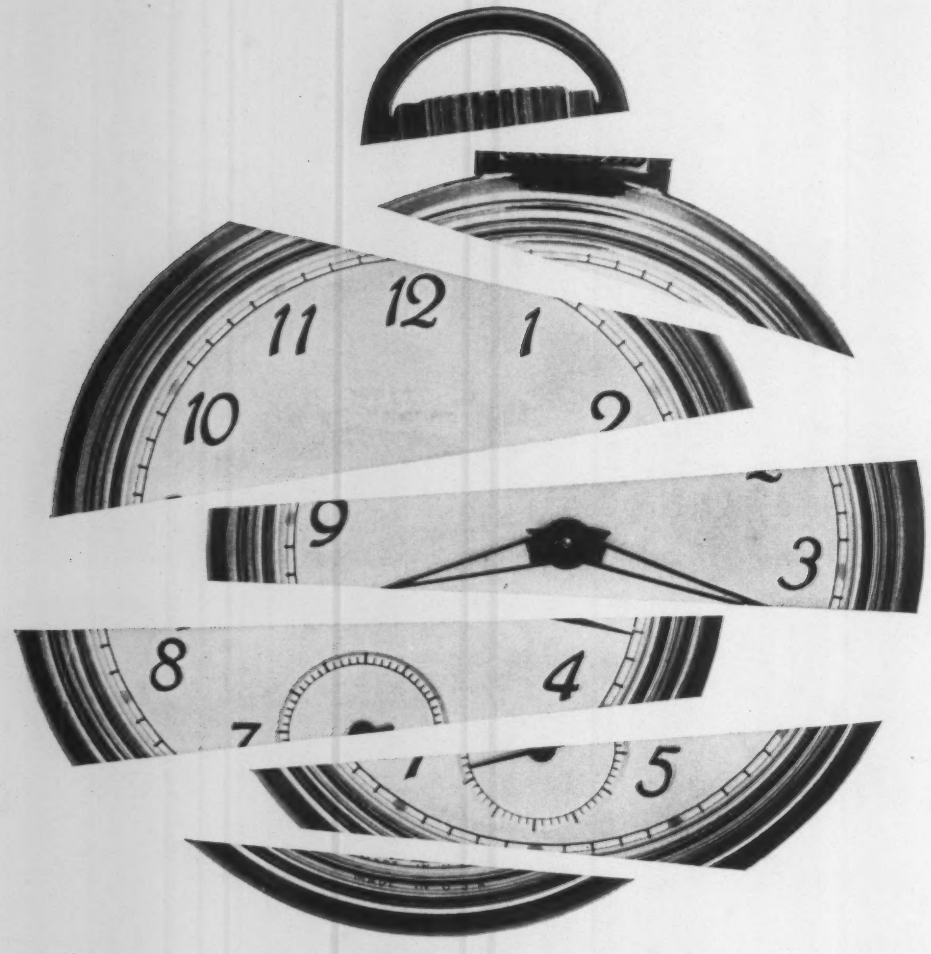
Conveyor Machinery and Belting • Power Transmission
Hose • Vibrating Equipment • Engineering Services



For General Time Corporation

PRODUCTION ANSWERS FALL INTO PLACE, SAVE $56 per 1,000 UNITS WITH SCOTCH-WELD®

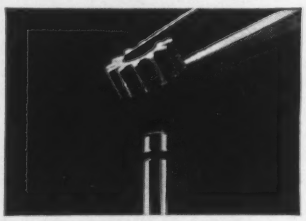
BRAND STRUCTURAL ADHESIVES

Before a SCOTCH-WELD Brand Structural Adhesive joined the assembly line, attaching tiny gear heads to mounting pins was a tedious and costly operation for Haydon Division, General Time Corporation, Torrington, Conn. High-temperature brazing frequently distorted gear configuration, warped shafts, upset metal hardness. A 100% inspection, with rejects aplenty, was required to assure watch-like accuracy in the final product—synchronous timing motors.

A 3M Field Engineer suggested SCOTCH-WELD EC-1386. In production, bonding gears to shafts with this epoxy-type adhesive eliminated the distortion-causing heat problem, ended high rejects, made 100% inspection unnecessary. The void-filling properties of EC-1386 reduced tolerances required between shaft and gear. And best of all, savings of $56.37 per thousand assemblies resulted!

Chances are your company can save money, speed production, simplify putting new designs into production by taking advantage of SCOTCH-WELD Structural Adhesives or other adhesive products developed by dynamic 3M research. Ask the nearby 3M Field Engineer to show you how! Or write AC&S Division, 3M Co., Dept. 3BQ-71, St. Paul 6, Minn.

"SCOTCH-WELD" is a reg. TM of 3M Co.



SCOTCH-WELD EC-1386 simplifies bonding gear to shaft by eliminating high brazing heat that distorted the tiny parts, changed metal hardness.

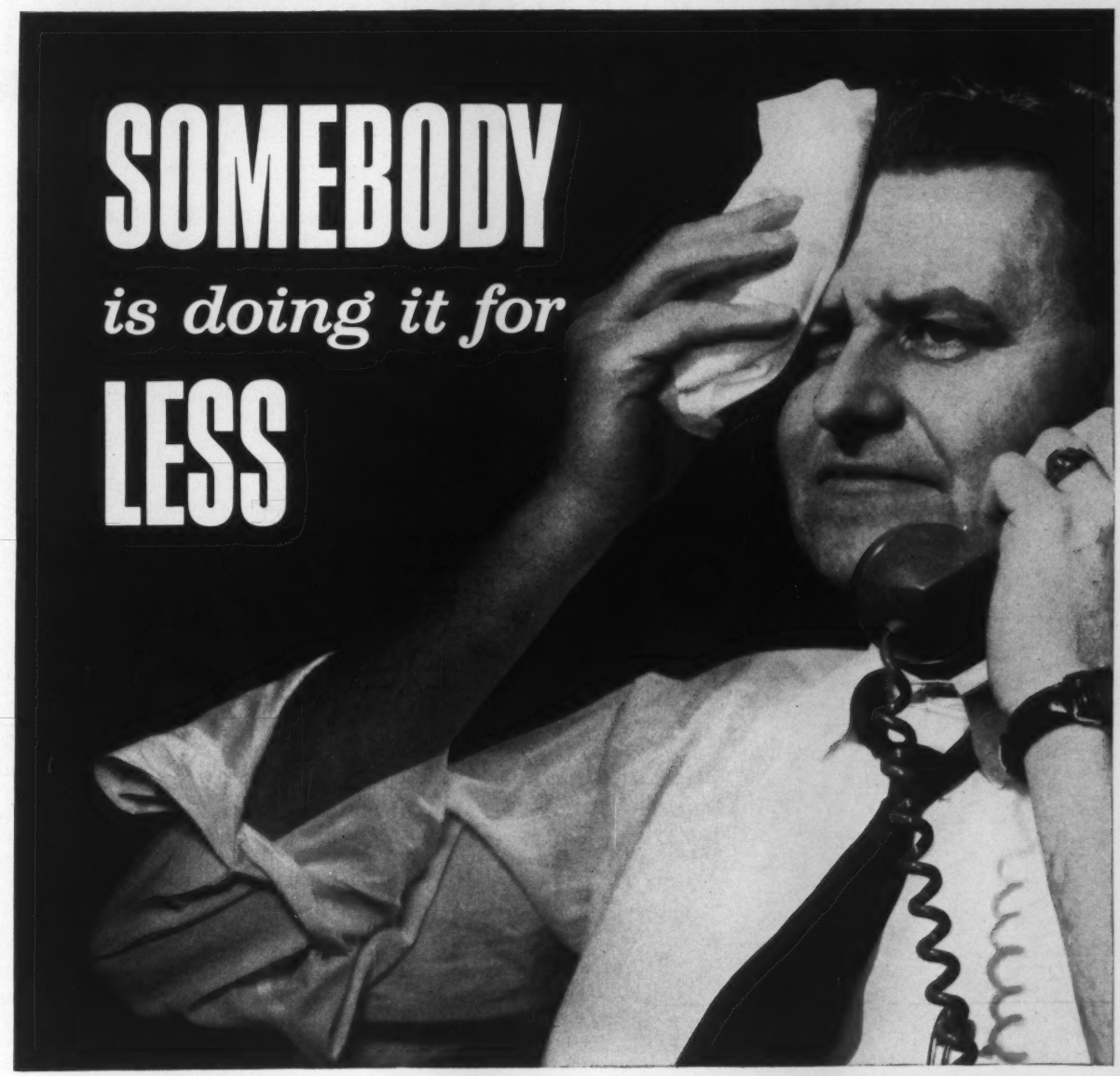
ADHESIVES, COATINGS AND SEALERS DIVISION

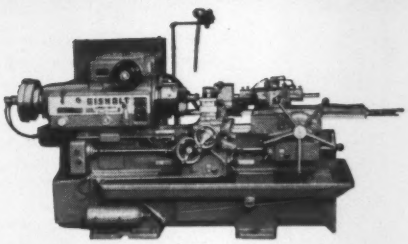
MINNESOTA MINING AND MANUFACTURING COMPANY

...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

SOMEBODY *is doing it for* LESS





MASTERLINE® NO. 4 Ram Type Turret Lathe—offers fast, easy operation, 16 spindle speeds to 2000 rpm and 25 hp driving motors for maximum metal removal with carbides.

Simplified controls, tracers for complex jobs (shown) and operator-oriented design permits handling short run work at minimum cost in time, labor and tooling.

Contact your Gisholt Representative or write for Catalog 1215.

Things can get pretty hot in a job shop.

Competition forces you to quote new machine rates. Yet, if you're average, over 60% of the ram type turret lathes in your shop are 10 years old. They're only half as efficient as today's models.

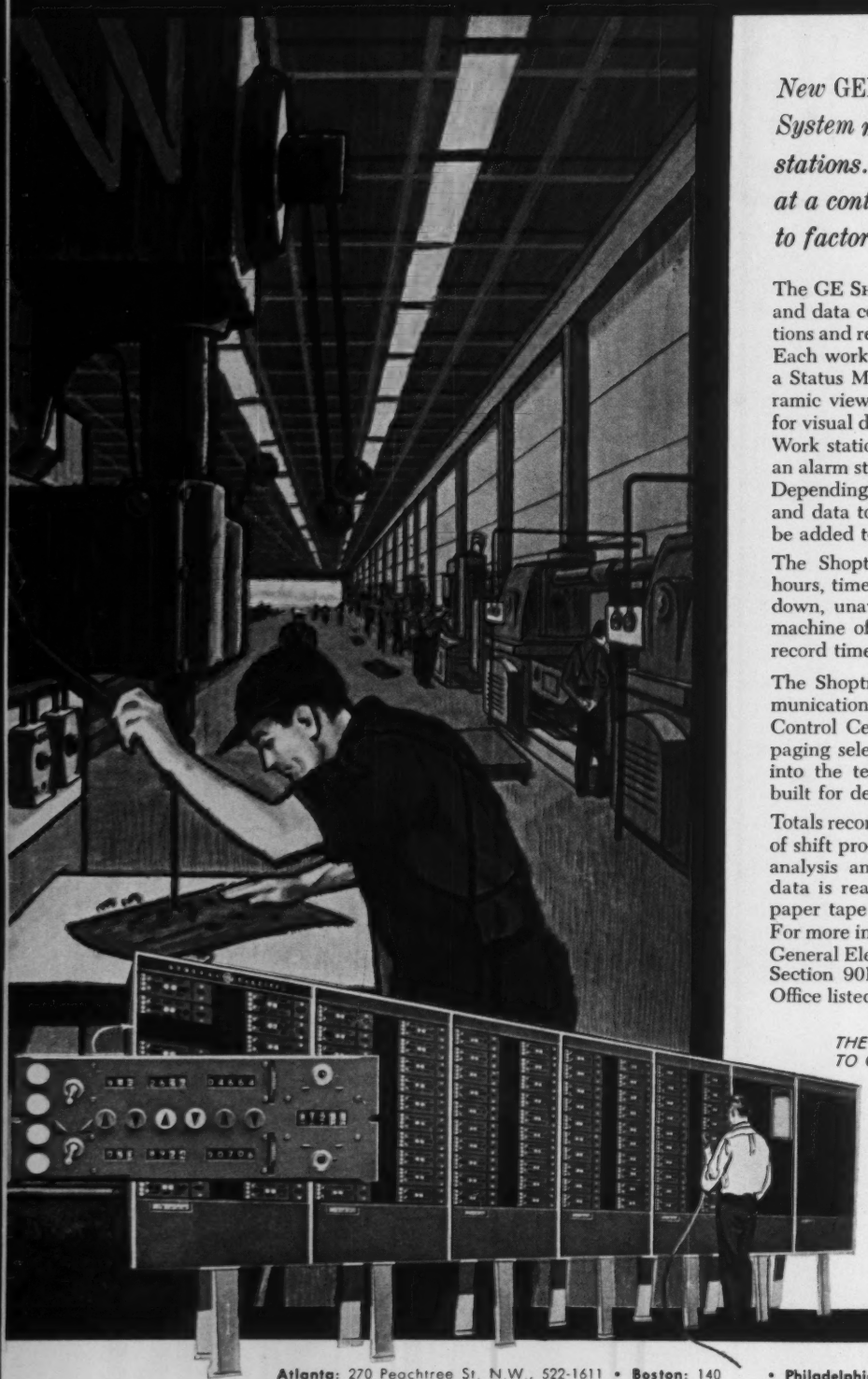
It's easy to see how profits . . . and contracts can be lost.

There is only one answer . . . replace old with new. Find out now, how Gisholt Ram Type Turret Lathes can help you do it for less.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers® • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

ONE OF THESE NEW GE MANAGEMENT CONTROL



New GENERAL ELECTRIC SHOPTROL

System monitors individual work stations...displays production status at a control center for timely reactions to factory conditions.

The GE SHOPTROL SYSTEM is a factory monitoring and data collection system that monitors work stations and records production data at a central point. Each work station's status is visually displayed on a Status Monitor. Status Monitors present a panoramic view of up-to-the-minute factory conditions for visual display at the Production Control Center. Work stations have an operator control station, or an alarm station terminating at the Control Center. Depending on complexity of communication needed and data to be transmitted, a paging selector may be added to each work station.

The Shoptrol System records, in hundredths of hours, time elapsed for operations, set-up and tear down, unavoidable delays, machine running, and machine off conditions. The Shoptrol System can record time elapsed, or count pieces or operations.

The Shoptrol System provides direct signal communications from work stations to the Production Control Center. The operator control station and paging selector have phone jacks to provide entry into the telephone intercom. Units are ruggedly built for dependable life in factory conditions.

Totals recorded from the Status Monitors at the end of shift produce information for production control analysis and management decision making. The data is readily convertible to punched cards or paper tape for input to a data processing system. For more information, write for brochure CPB-152, General Electric Company, Computer Department, Section 90N7, Phoenix, Arizona, or your District Office listed below.

THE GE SHOPTROL SYSTEM CONTRIBUTES TO GREATER PRODUCTION EFFICIENCY BY:

...providing constant communication between production control center, foreman, and work station operators.

...collecting and displaying current production data for each work station.

...increasing accuracy of production records.

...providing immediate production status for management at all times.

Atlanta: 270 Peachtree St. N.W., 522-1611 • **Boston:** 140 Federal St., HU 2-1800, Ext. 311 • **Chicago:** 120 S. La Salle St., 782-5061 • **Cleveland:** 215 Euclid Ave., SU 1-6822 • **Dallas:** 3200 Maple Ave., RI 8-0589 • **Detroit:** 680 Antoinette St., TR 2-2600 • **Houston:** 4219 Richmond Ave., MO 7-3301 • **Kansas City, Mo.:** 106 W. 14th St., GR 1-2919 • **Los Angeles:** 1010 S. Flower St., DU 1-3641 • **Louisville:** Bldg. 6, Appliance Pk., GL 4-7511 • **Minneapolis:** Plymouth Bldg., 6th & Hennepin, FE 2-7569 • **New York:** 122 E. 42nd St., PL 1-1311, Ext. 3205 • **Philadelphia:** 3 Penn Center Plaza, LO 8-1800 • **Phoenix:** Guaranty Bank Bldg., 3550 N. Central Ave., AM 4-3741-2 • **Pittsburgh:** 1634 Oliver Bldg., Mellon Sq., AT 1-6400, Ext. 566 • **San Francisco:** The Russ Bldg., 235 Montgomery St., DO 2-3740 • **Schenectady:** Bldg. 2, 1 River Rd., FR 4-2211, Ext. 5-4405 • **Seattle:** Dexter Horton Bldg., 710 Second Ave., MA 4-8300 • **St. Louis:** Paul Brown Bldg., 818 Olive St., GE 6-4343 • **Syracuse:** 1010 James St., GR 6-4411, Ext. 6141 or 6142 • **Washington, D.C. Area:** 7401 Wisconsin Ave., Suite 514, Bethesda, Md., OL 2-8100.

SYSTEMS WILL SAVE YOU MONEY THIS YEAR

New GE 3101 DATA ACCUMULATION and COMMUNICATION *System provides immediate plant/office data communication...as a management tool to increase production and reduce costs.*

The GE 3101 is General Electric's answer to the need for an economical and effective means of collecting operational data. Key areas such as purchasing, receiving, quality control, shop operations, warehouse, shipping, etc., send current data to a central point for collection and display. Each of the key areas has a Collector that sends data to the Accumulator, where it is punched into paper tape for a permanent record. Data originating at the Collector is from punched cards and/or 19 variable dial settings. Collectors may be up to 10,000 feet from the Accumulator.

The punched paper tape can produce a typewritten copy immediately for visual display of current conditions; can be converted to punched cards; or can be used for direct input to a computer system. Investigate this new, lower cost development by General Electric.

Installation of the GE 3101 information gathering system can result in greater operational profits due to: accuracy and timeliness of data, economy of operation, and quicker access to the facts for well informed decisions by management.

For more information, write General Electric Company, Computer Department, Section 90N7, Phoenix, Arizona, or contact your nearest General Electric Computer Department District Office listed below.

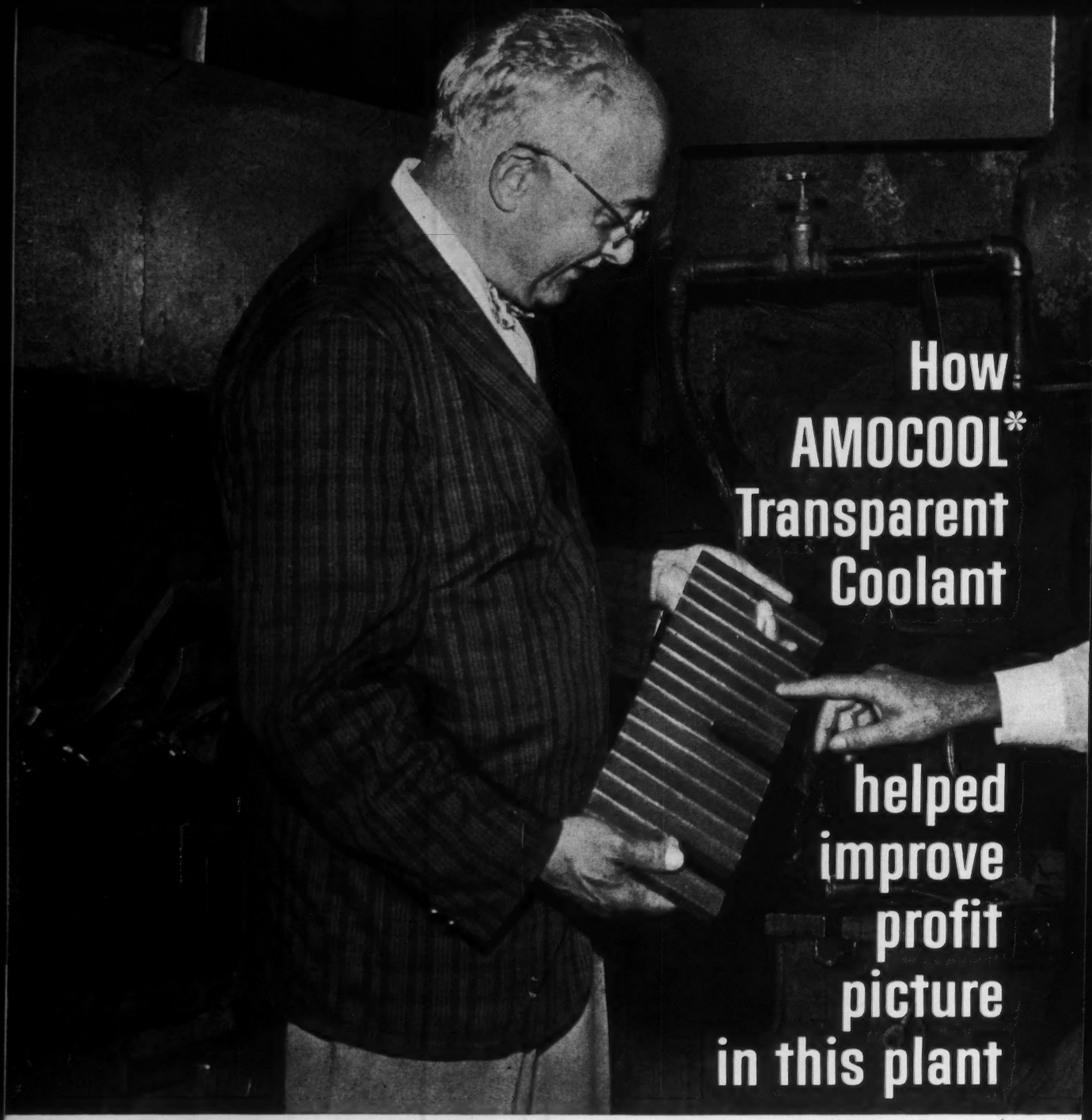
In Canada: Canadian General Electric Co., Ltd., Electronic Equipment and Tube Dept., 830 Lansdowne Ave., Toronto, Ontario, Canada. **Outside U.S.A. and Canada:** Producer Goods Export Department, International General Electric Company Division, 150 East 42nd Street, New York City, N.Y., U.S.A.

INFORMATION PROCESSING AUTOMATED BY GENERAL ELECTRIC

Progress Is Our Most Important Product

GENERAL ELECTRIC

CPA 90 (7-61)



How AMOCOOL* Transparent Coolant helped improve profit picture in this plant

*Trademark

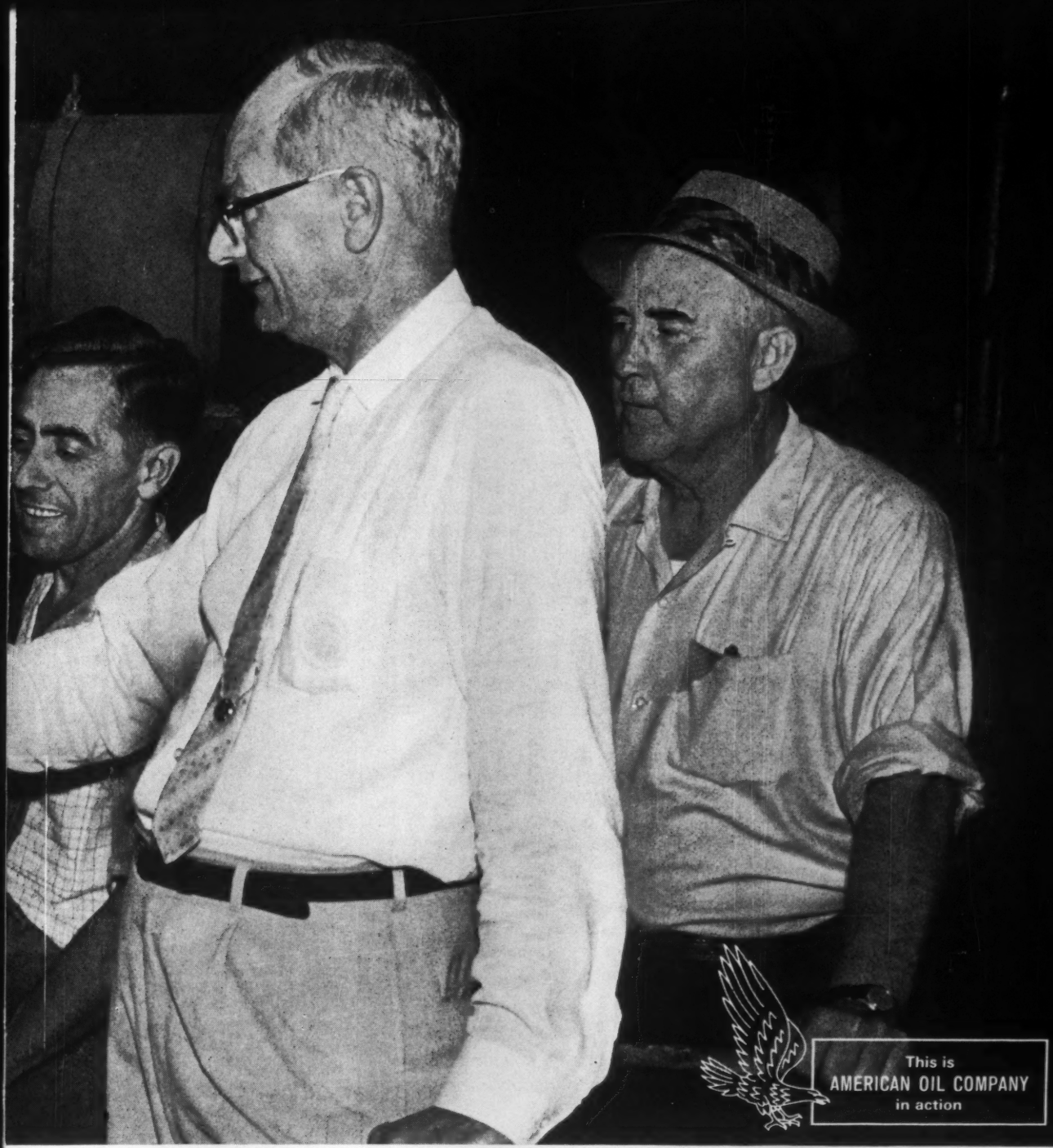
BY PAUL E. "PAPPY" STRATTON

About the Author. "Pappy" Stratton has been providing technical help on lubrication and metalworking problems to customers in the Detroit area for nearly all of the twenty-five years he has been working for the company. In addition to having this store of practical experience to help him, Pappy has completed the Company's Sales Engineering School.

* * *

By using a soap-base grinding compound, Detroit Edge Tool Company was getting excessive corrosion and rust on work and grinding machines. Oil vapor was collecting on machines and on the ceiling, causing dirty working conditions. Most important, high wheel loading was causing frequent down-time for wheel dressings.

We worked out a test program on AMOCOOL Transparent Coolant with the management. On our first test on one surface grinder, feed pressure was cut substantially while at the same time metal removal was increased.



Eliminate reworking because of rust, reduce wheel loading and extend intervals between wheel dressings; do these and you increase profit per unit, explains Detroit Edge Tool president, Dan Ebbing, to P. E. "Pappy" Stratton of American Oil. Plant manager, John Yonker (right) and Sam Vineh, operator, look on.

The cost of reworking parts to remove rust was eliminated. Time required to clean machines to get rid of the odor was cut in half. Less wheel loading and fewer wheel dressings have upped production and reduced costs. Our test program paid out in an improved profit picture. All grinding and drilling equipment has been converted to AMOCOOL Transparent Coolant.

* * *

Would you like this kind of technical help to assist you in improving profits? Get it by calling the American Oil Company office nearest you.

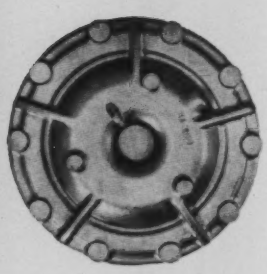
Quick facts about
AMOCOOL
Transparent Coolant

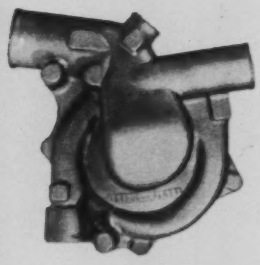
- Clear, transparent fluid
- Controls corrosion on work and machines
- All chemical. Does not support bacteria growth
- Unaffected by humidity
- Fire resistant
- Odorless

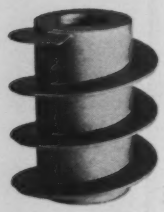
AMERICAN

AMERICAN OIL COMPANY
910 South Michigan Avenue
Chicago 80, Illinois

lower production costs with Decatur quality castings







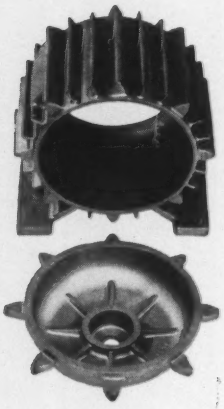
In the highly competitive field of gray iron castings, buyers constantly seek greater reliability at lower cost. They lower costs by using castings which require minimum finishing and have the lowest rejection rate.

Decatur Quality Castings® have exceptionally smooth surface finish comparable to shell or permanent mold castings. When required, precisely controlled heat treating in our furnace gives these castings the uniform metallurgical properties necessary for high production machining. Preparation of unmachined areas is usually unnecessary.

Decatur castings are shipped to your plant in our trucks when quantities permit to insure prompt service.

We are light gray iron and alloyed iron specialists supplying castings weighing a few ounces to 100 pounds.

D®



THE DECATUR CASTING CO.

Decatur Quality Castings® Light Gray Iron and Alloyed Iron Specialists
Decatur, Indiana • Phone: Decatur 3-2700

Kingsbury machine performs all the operations on the HOLE IN ONE chucking

Operator loads stainless steel "irons" of any shape at random

We used a similar headline in a 1931 ad and couldn't resist using it again. In thirty years our machines have changed a lot. But the basic principle is still the same: Combine operations in one chucking for lower unit costs and closer tolerances.

You could probably build your own machine for a simple job like this. It might cost you less. But you might also sacrifice accuracy and reliability.

On this job both the concentricity and diameter of the tapered hole are critical. If the hole were not concentric with the O.D. of the stem, the head would not align with the shaft of the club. So the spindles and work fixtures are in perfect relationship.

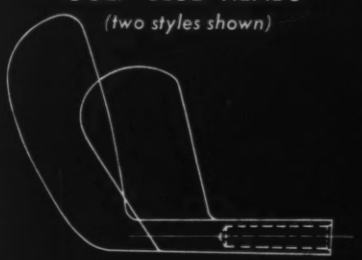
The hole diameter is also critical because its taper is so shallow. If the diameter were only .003 oversize, the shaft would go ½-inch too far into the hole and the club would be too short. So we hold the depth of taper exactly.

Even on much tougher jobs, Kingsbury machines turn out good parts hour after hour, month after month. That's because of good basic design and accurate, rugged construction. We run off test samples for your approval before shipment.

To save money in drilling type operations, ask us for a proposal. Kingsbury Machine Tool Corporation, Keene, New Hampshire.

KINGSBURY

FORGED STAINLESS STEEL GOLF CLUB HEADS
(two styles shown)



Vertical Unit with Milling Head

1—*MILL OFF THE STEM END*

Four Horizontal Units

2—*DRILL HALF DEPTH*
3—*DRILL FULL DEPTH AND CHAMFER*
4—*ROUGH TAPER REAM*
5—*FINISH TAPER REAM*

6—*LOAD AND UNLOAD*

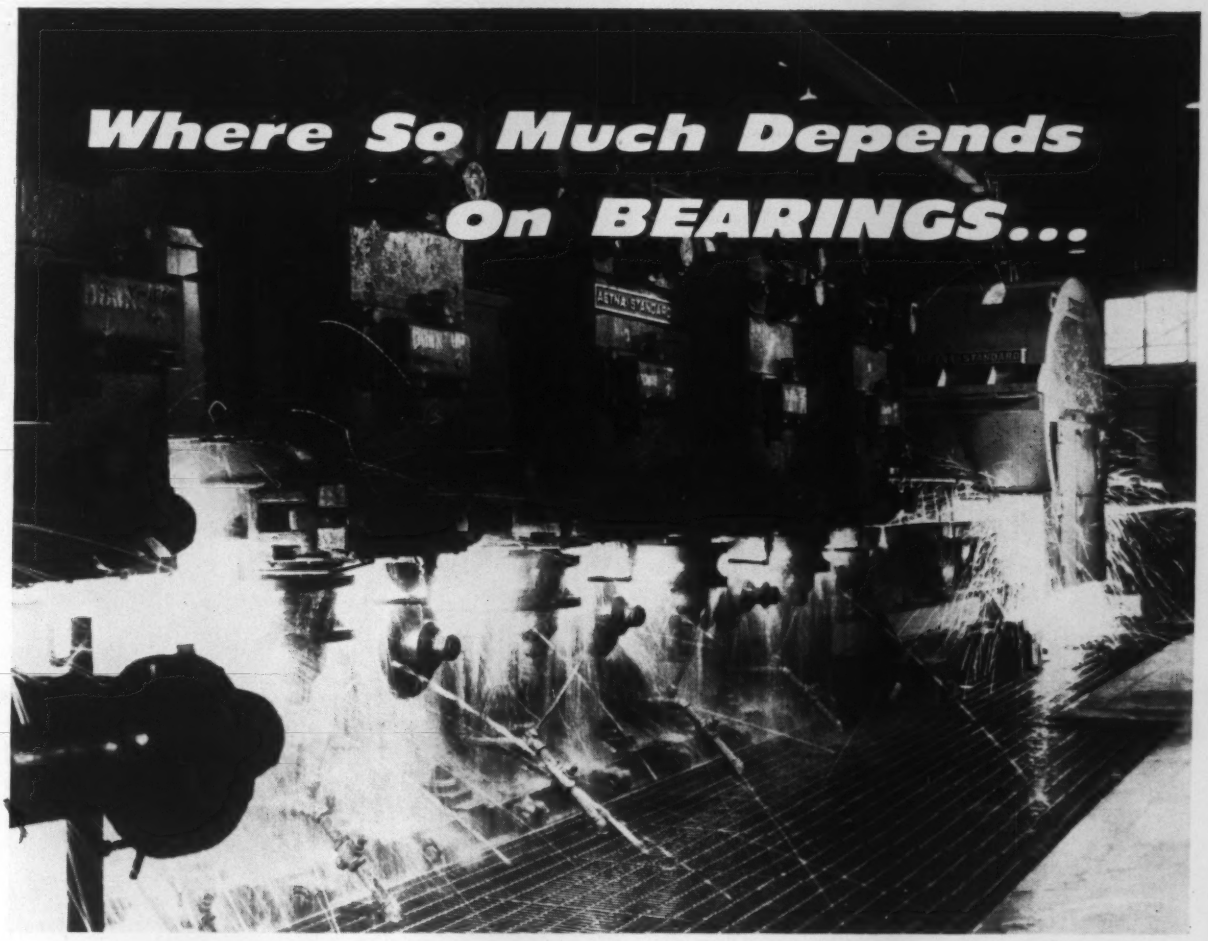
Illustrated above are only a few of the many different sections in the standard range held. In point of fact, almost any practicable shape can be supplied on request.

THOS. W. WARD LTD

Write to Overseas Trade Dept. I. A.
HEAD OFFICE: ALBION WORKS, SHEFFIELD, ENGLAND
Cables: Forward, Sheffield

London Office: Brettenham House, Lancaster Place, Strand, W.C.2

Have you received your current copy of The Albion Machinery Catalogue? If not, write for one today. This catalogue contains a comprehensive stock list of all new and secondhand Plant and Machinery, including Machine Tools, Contractors' Plant, Generating Sets and Pumps. It is regularly brought completely up to date and reprinted.



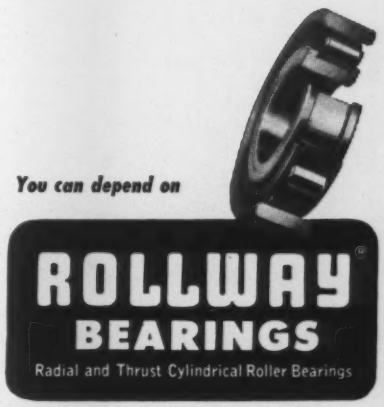
Rollway Bearing - equipped pipe - forming and welding stands at J & L Aliquippa Works. Rollways are also used in other equipment at Aliquippa, including cranes, crane hooks and mill motors.

It Pays to Depend On ROLLWAY

The addition of two Continuous Weld® Pipe Mills has greatly increased Jones and Laughlin's monthly production of welded pipe. The mills have operated since 1957.

Both mills are Rollway Bearing-equipped, as are J & L's Stretch Reducing Mill and Electric Weld Tube Mill, installed at the same time.

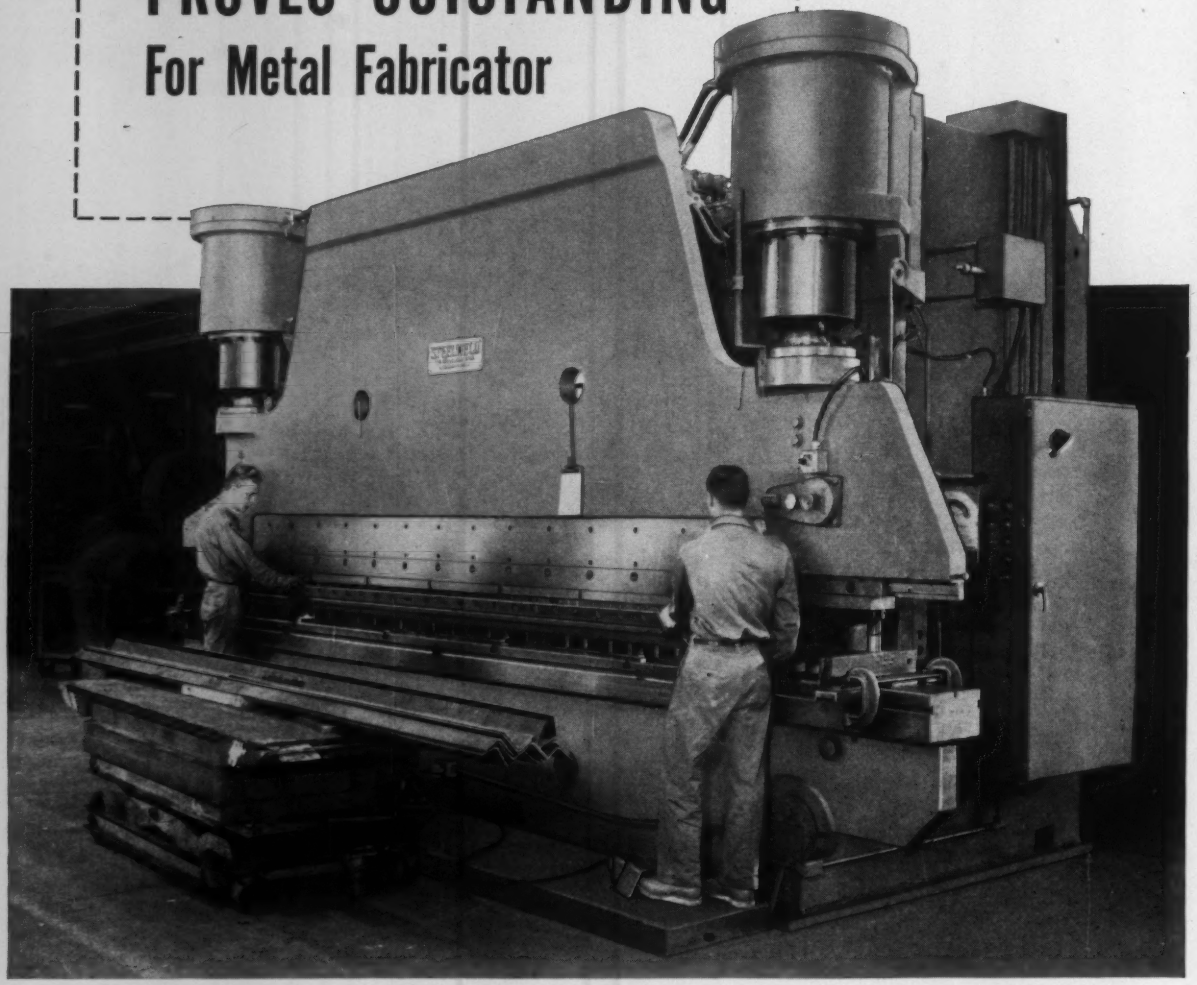
Operations like these demand component reliability. Dependable Rollway Bearings regularly provide it. You can choose from a complete selection of sizes and types with maximum capacities. Consult Rollway's nearest Engineering Office to select the bearing just right for your job. Or start by writing for Product Line Catalog PL-559. Rollway Bearing Co., Inc., Syracuse, N.Y.



ENGINEERING OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Seattle • Houston • Philadelphia • LosAngeles • SanFrancisco

Hydraulic Press Brake PROVES OUTSTANDING For Metal Fabricator

Model MH16-14 Steelweld Hydraulic Press Brake. Overall bed and ram length 20'-0". Capacity 650 tons.



A 650 ton Steelweld Hydraulic Press Brake is a mighty important tool at The Bargar Metal Fabricating Co., Cleveland. It performs a wide range of operations such as bending, forming, stamping, punching, drawing.

The brake is especially good for bending large plates, because the ram can be traveled at exactly the right speed to prevent whipping of the plate. Sometimes plates as large as 10' x 20' x ¼" are bent.

The machine is very useful for drawing operations, excelling mechanical press brakes for this work, because it can be operated at the speed that is most suitable for the metal. Also, the ram can be traveled through a greater distance because of the unusually long 16-inch stroke. The power is constant for the entire stroke.

Much punching is done with the Steelweld, and this work is speeded by adjusting the ram stroke to travel only slightly more than the thickness of the plate. The fact that the ram can be inched to the work and backed away whenever desired is another time-saving feature especially helpful when setting up dies.

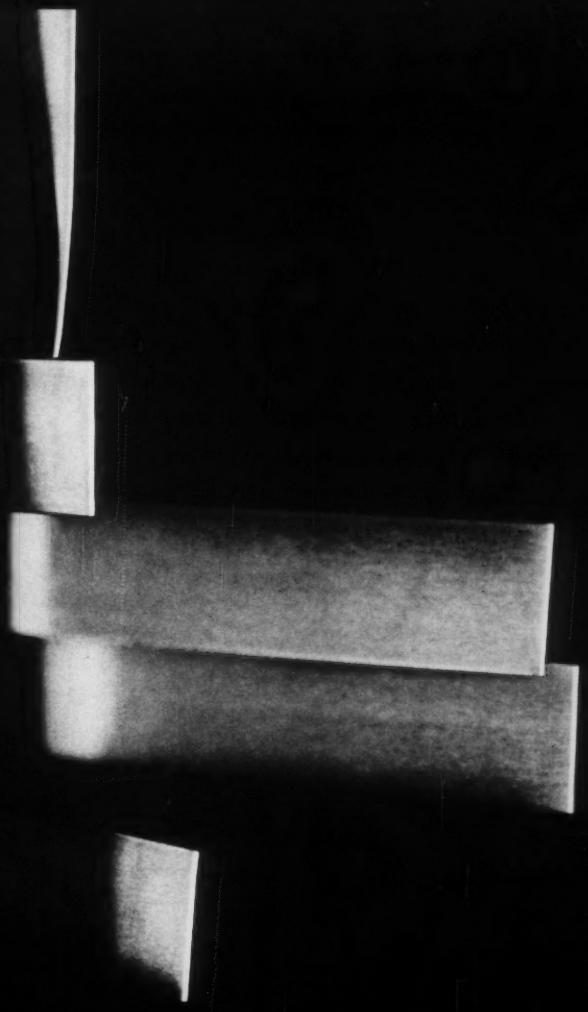
The Bargar Company has one of the finest and most completely equipped sheet metal fabricating plants in Cleveland. The Steelweld Brake is a good example of their modern production facilities.

Write for free booklet No. 2024

STEELWELD
MECHANICAL and HYDRAULIC
PRESS BRAKES

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

STEELWELD MACHINERY DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4882 E. 281 ST. • WICKLIFFE, OHIO



FINGERS OF STEEL . . .

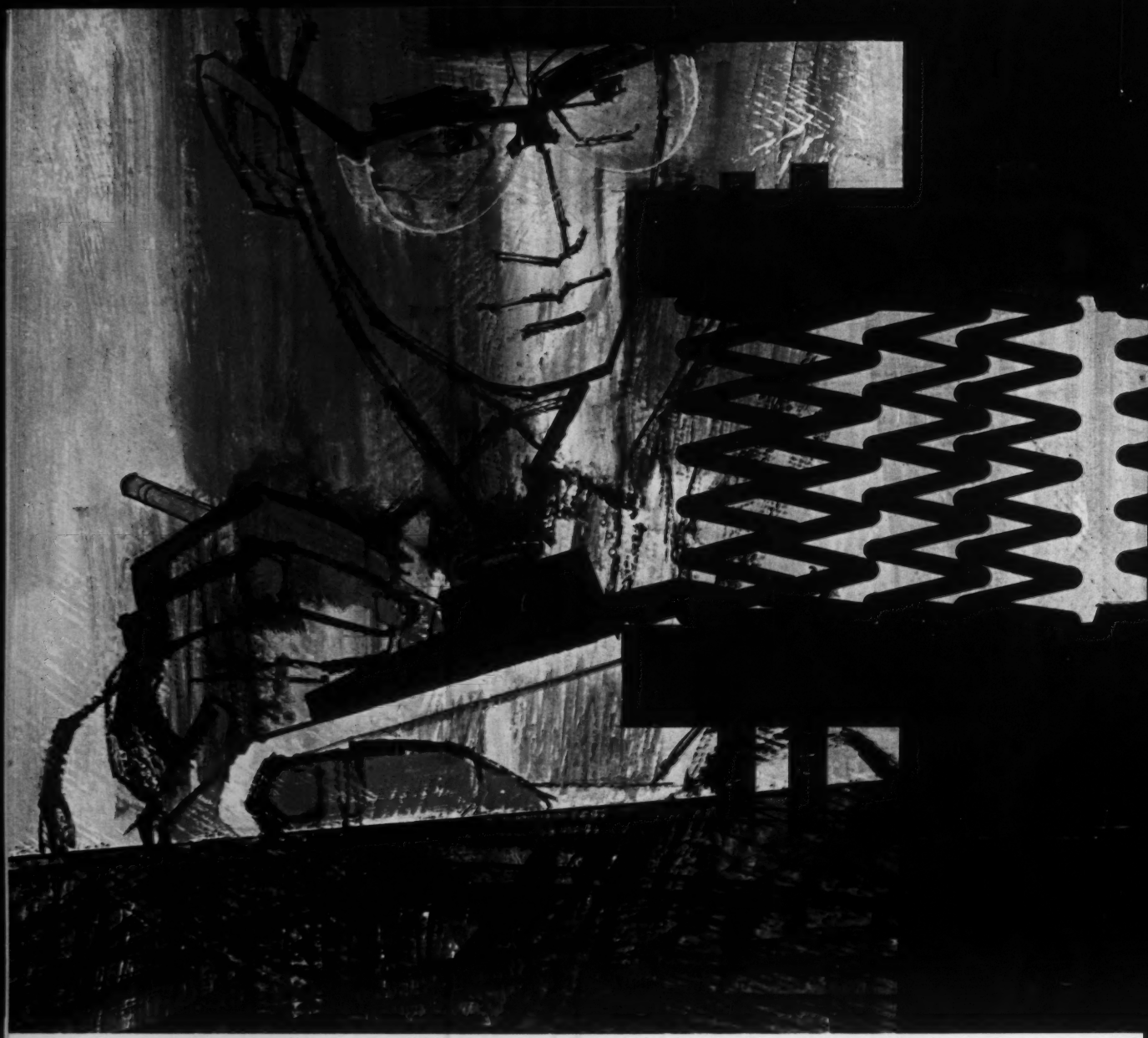
. . . high-carbon spring steel from the Athenia Steel Division of National-Standard is available in widths up to 6½″ tempered and 16″ cold rolled or annealed, with thicknesses from .001″ to .065″.

The high quality and uniformity of Athenia spring steel is the result of precision rolling, polishing and slitting to rigid standards on the most modern equipment. Athenia Steel is available from National-Standard Company, Clifton, New Jersey, and from the following: **National-Standard Warehouse, Plainville, Conn.; D & B Steel Co., Cleveland; Krusen Wire & Steel Co., Los Angeles; Lapham-Hickey Steel Corp., Chicago; Voss-Davidson Steel Co., Detroit; Zurbach Steel Co., Somerville, Mass., Plainville, Conn.**

For technical information, write to . . .

NS
NATIONAL STANDARD COMPANY

Athenia Steel Division
NATIONAL-STANDARD COMPANY
Clifton, New Jersey



New N-S stainless wire tests 100,000 psi

From National-Standard research and development comes NS-355—a stainless steel, corrosion resistant spring wire having much greater elasticity than conventional stainless steel wire.

NS-355 is a semi-austenitic alloy, originally developed for use in heavy wire sections fabricated from bar, billet or plate stock—applications requiring corrosion resistance, strength, durability and hardness. National-Standard searched for a way to apply these outstanding advantages to highly stressed spring wire applications.

After comprehensive research in processing methods, National-Standard metallurgists developed the capability to draw NS-355 alloy into exceptionally high-tensile spring wire. Spring production tests were made on .125 and .075 inch diameter wire samples with a tensile strength over 100,000 psi higher than music spring wire, proving that NS-355 wire could be satisfactorily run on automatic coiling machines with excellent formability.

Further evaluation tests were conducted in the Spring Laboratory of Bendix Corporation, South Bend, Indiana. Here, engineers ran life cycle tests on NS-355 stainless steel springs and determined spring modulus values. On a mechanical cycling unit—eight springs to a fixture—NS-355 springs

above music wire

were subjected to 600 compression cycles per minute—a total of 10-million cycles under stresses from 20,000 to 150,000 pounds.

The development of NS-355 stainless steel spring wire creates an entirely new solution to highly stressed, corrosion resistant spring requirements for jet engines, food and beverage equipment, chemical machinery and a growing number of other special wire applications.

For more information about new NS-355 stainless steel spring wire, or help in developing high quality wire to meet your special or unique applications, write National-Standard Company, Niles, Mich.

National-Standard NS-355 stainless steel springs with an index as low as 3 can be formed on automatic coiling machines without breakage.

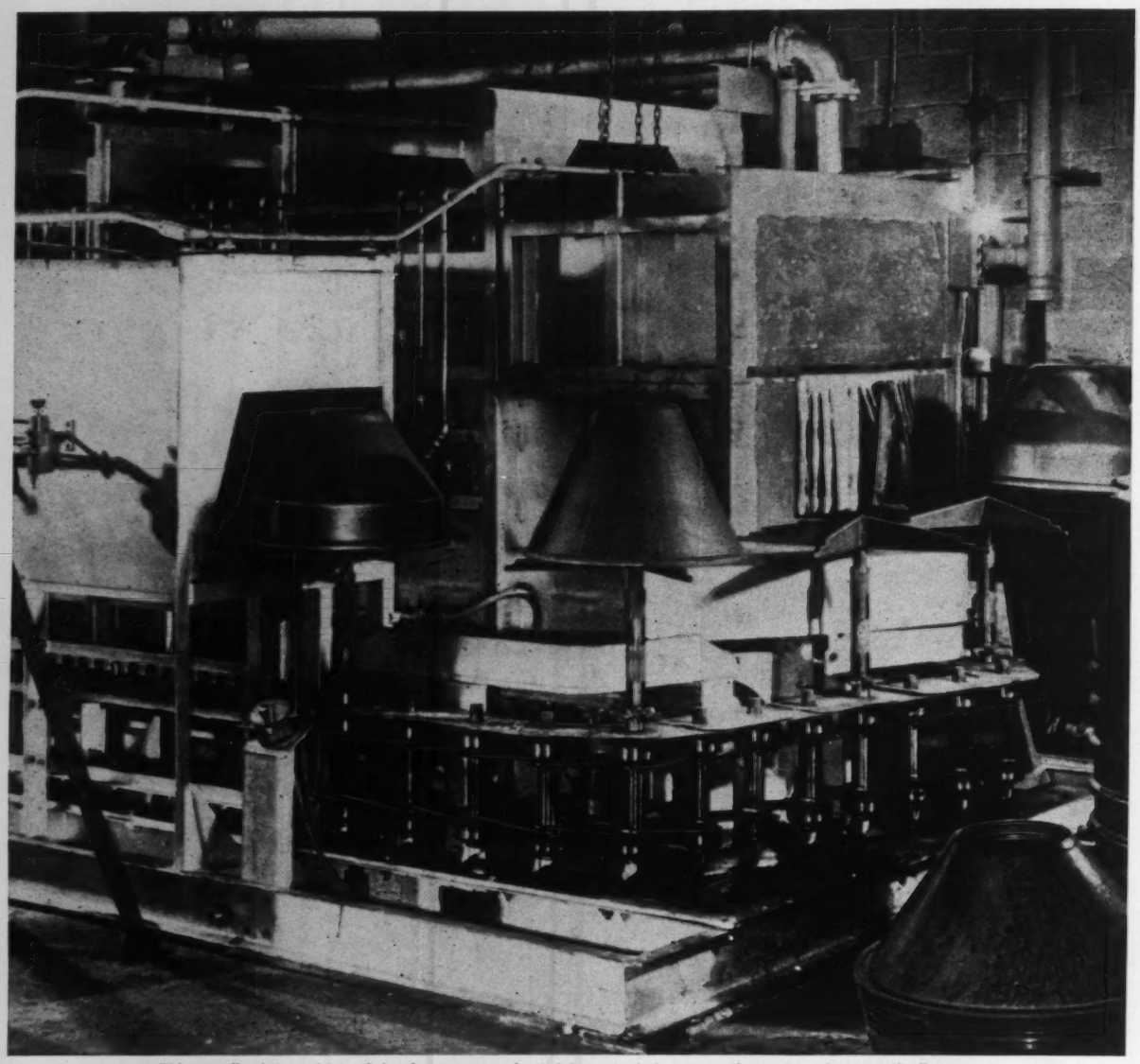
NS NATIONAL-STANDARD COMPANY

Manufacturer of Specialty Wire & Metal Products

NATIONAL-STANDARD COMPANY

Niles, Michigan

61-W03



This gas-fired, tunnel-type Selas furnace anneals stainless steel shapes continuously and automatically on a 3 minute cycle. Fast gas-heating to 1600° F. effectively restores ductility with precise temperature control.

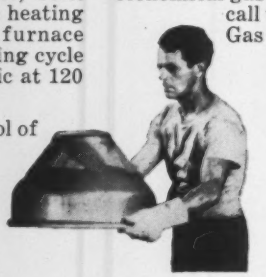
Speeds stainless parts production with new GAS-fired tunnel annealing furnace

A busy metalworking plant faced the problem of speeding up the in-process annealing of stainless steel conical shapes. They wanted a faster way to restore ductility lost in cold forming.

Solution: a continuous, gas-fired tunnel furnace, built for them by Selas Corporation of America. The heating speed of *gas* in the radiant burners of this furnace increased annealing output 6 times over. Annealing cycle was reduced to 3 minutes. Operation is automatic at 120 pieces an hour.

What's more, with the precise temperature control of gas, ductility is restored so effectively that the scrap rate of the pieces is greatly reduced. Production and quality up . . . operating costs down!

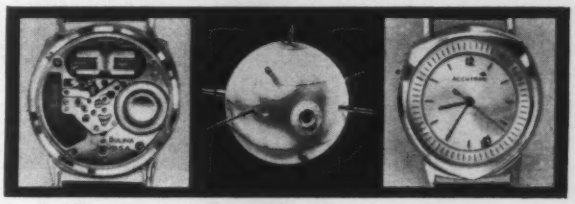
Speed production and control quality with fast, precise, economical gas heat. For information and technical help, call the Industrial Sales Engineer at your local Gas Company. *American Gas Association.*



FOR HEAT PROCESSING GAS IS GOOD BUSINESS!

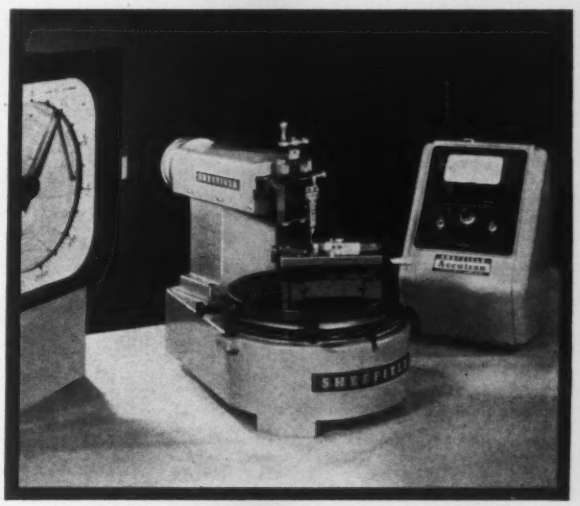
THIS IS ACCUTRON†®

† TIME-KEEPING Great interest has been focused on the new Bulova ACCUTRON timepiece, a watch described by Bulova as "the first instrument of the space age you can wear and use! . . . It doesn't even tick. It hums! First timepiece guaranteed accurate on your wrist." "Accutron" is Bulova's trademark for timekeeping devices. It stands for new standards of accuracy.



® GAGING We welcome Bulova's use of the word "Accutron" as a compliment to the term already distinguished in the field of precision measurement. "Accutron," a Sheffield trademark for gaging devices, has long been a symbol of unquestioned accuracy and reliability. The Sheffield Accutron amplifier, for example, can show dimensions down to two and a half millionths of an inch, and is readily adaptable to an almost unlimited range of electronic gaging heads and tooling, for checking almost any dimension, shape, or relationship. Feathertouch gaging heads (with pressures as low as 5 grams) permit reliable measurements of soft or easily distorted parts. Accutron instruments are in constant service in Sheffield's own Eli Whitney Metrology Laboratory.

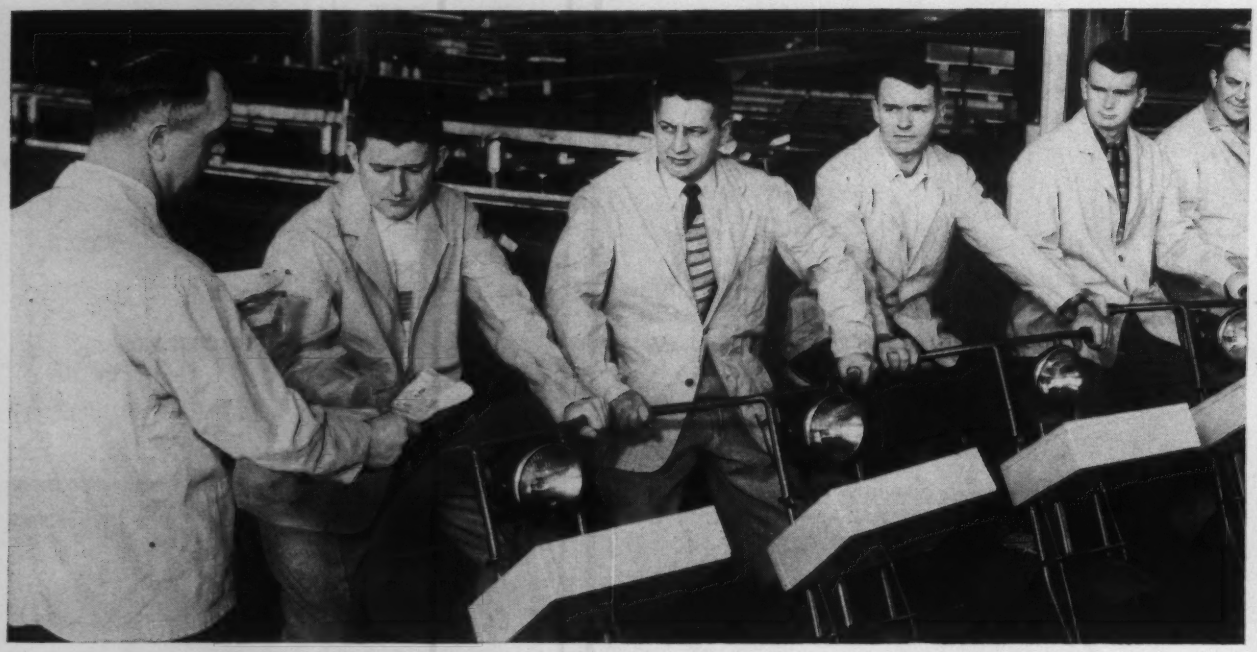
Your Sheffield representative can give you prompt competent technical assistance in any phase of your gaging needs. Write for the Sheffield catalog on ACCUTRON gages and accessories.



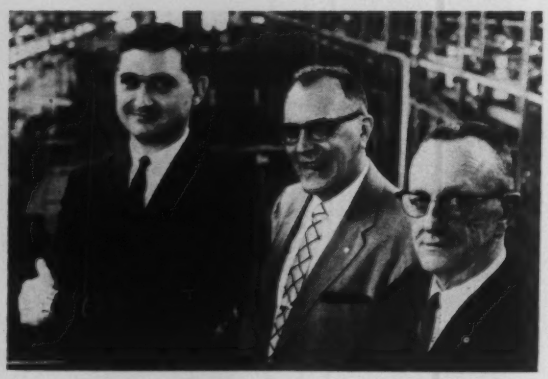
The
SHEFFIELD
Corporation *Dayton 1, Ohio*

A subsidiary of The Bendix Corporation

Inspection Gages, Dimensional Control Instruments, Machine Controls, Automatic Gaging & Assembly Systems, Measuray® X-Ray Thickness Measuring, Crushtrue® & Multiform® Grinders, Cavitron® Ultrasonic Machine Tools, Press-Pacer® Transfer Units, Large Dies, Tooling, Contract Manufacturing.



Central Steel & Wire can load



Left to right: Robert Hughes, Manager, Stainless Steel Sales; Ralph Kroll, Manager, Inside Sales; William Steinway, Shop Superintendent.

Order Stainless Steel
from your nearest
Steel Service Center

How's this for efficiency: at Central Steel & Wire Company's Cincinnati warehouse, they figure they can save six minutes per trip by sending a messenger with an order to a stock bay on a motor scooter. Some 70% of Central's orders are delivered the next day, and it's routine to have an order for steel on a truck within 30 minutes after it's received. Central at Cincinnati had its own private telephones installed as far away as Columbus, Dayton, Springfield and Hamilton, Ohio, because they thought the mails were too slow. Central is mechanized in this highly efficient way to keep over 5,000 Cincinnati customers happy.

The company encourages new ideas on how to improve operations from everyone in the organization from dispatchers to crane operators to the president (who can also dispatch, and operate the crane). Everybody's goal: even better service. Central feels that wasted time and excess paperwork must eventually be paid for by customers themselves, so these stumbling blocks to efficient operation are eliminated as much as possible. Central was founded in 1909 in Chicago, and still has customers from those early days. They weathered the depression by *doubling*

a Stainless Steel order in record time

their sales force (and sales increased during the period). Today, their field men are supported by a 30 million dollar inventory. Central's Cincinnati plant stocks Stainless Steel plate from 3/16" to 3" thick. Their equipment includes shears, saws, slitters and "Heliarc"* custom cutting. Central Steel & Wire is one of the first steel warehouses in the country to have "Heliarc" cutting facilities. By this process, Stainless can be cut to close tolerances with no change in machinability, no distortion or discoloration; magnetic permeability is unchanged; there is a minimum of carbide precipitation, iron powder or any other type of contamination confined to the immediate adjacent area. The Stainless is ready to fabricate. This is important to Central Customers like Contour Forming Inc. of Newark, Ohio, maker of nose cone preforms for the Nike missile.

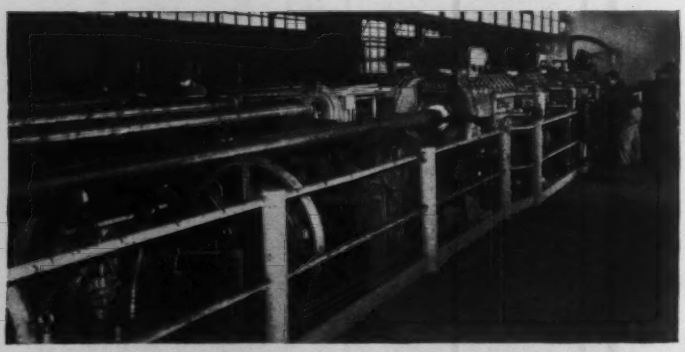
Contour forms nose cones in one pass from blanks of ¼" Type 304 Stainless. The blank is formed by the "Hydroforming"* process into an ogival shape, 6" diameter x 6¾" high. The blank is subjected to a 7-inch draw in which terminal forming pressures reach 15,000 psi. There is no fight between the die and the piece and practically no cold working. There is no galling and seizing between the members because the blank is fabricated without a female die. Why do they use Stainless? Because the clean-cut Stainless plate has superior metallurgical properties to meet the demands of the fabrication process *and* the end use. Tolerances must be met with microscopic accuracy; Stainless Steel's ease of fabrication solves the problem. It's another example of the versatility of Stainless Steel. From nose cones to milk dispensers, from paper making to food processing, Stainless Steel, supplied by Stainless warehouses like Central, makes products better. **Trademarks*

Stainless Steel has a higher first cost, but because of its unique combination of strength, corrosion resistance, and high temperature properties, it's worth more. In fact, no other metal can make such a material difference in so many applications. United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS is a registered trademark.

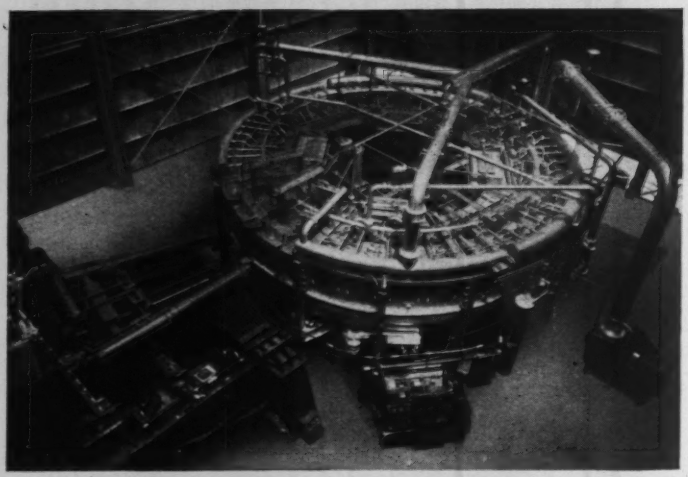
USS **United States Steel**

NEW SLANTS ON HEAT PROCESSING FROM SELAS

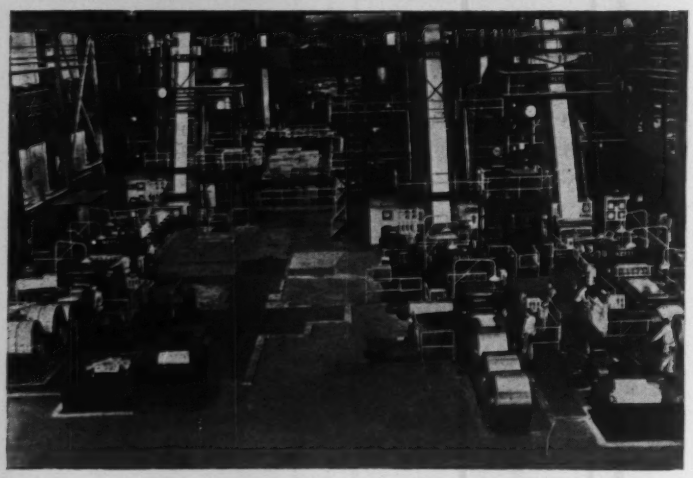
Here's how the Steel Industry uses Selas Heat Processing



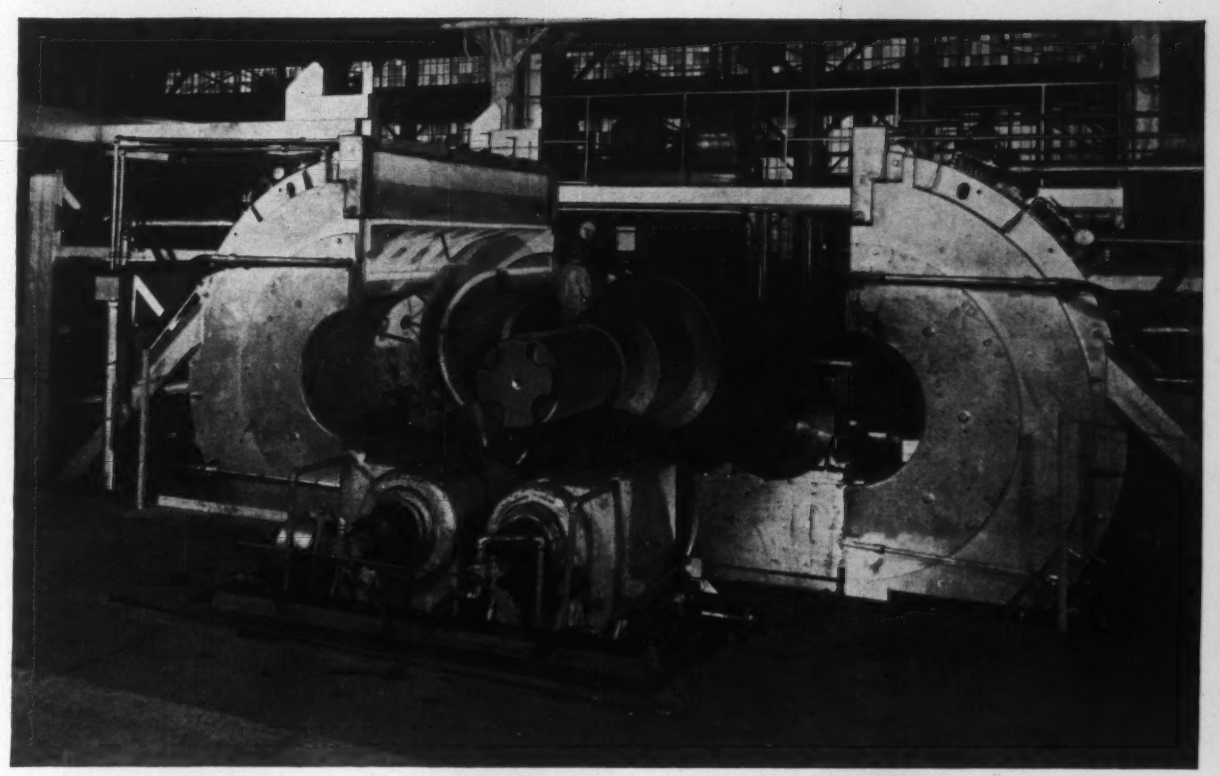
SEAMLESS TUBING *for oil-country application is hardened and tempered in this Selas continuous barrel-furnace line. The tubing is heated to 1600°F in five barrel-furnaces, uniformly quenched by annular water-spray unit, automatically transferred, then tempered in succeeding five barrel-furnaces. Rotation of the work during its forward motion through heating, quenching and tempering assures uniformity of physical properties and maximum straightness.*



STEEL BILLETS *of varying sizes for extruding are heated from room temperature to 2300°F in this Selas automatic, indexing rotary hearth furnace. This compact furnace, occupying floor space only 32' diam., has 32,500 lb. hourly capacity. Automatic mechanism loads and unloads 213-lb. billets on hearth at rate of 150 pcs/hr.*



STRIP STEEL *to 48" wide from cold reduction mill is in-line annealed and galvanized, without prior washing or pickling, or batch annealed strip is pre-heated and galvanized . . . continuously and at high speed . . . in these Selas GRADIATION® heat processing lines. Hard steel is rapidly pre-heated to produce galvanized hard sheet of superior coating quality and eye-appeal, or batch-annealed strip is uniformly pre-heated to selected temperatures producing galvanized sheet with adherent coating and good drawing properties.*



ROLL HARDENING *by* GRADIATION® *heating in this Selas split-cylinder type furnace makes practical a heat treatment that is difficult or impossible to achieve by other more conventional methods. Hardening the working surface of mill roll bodies to uniform, controlled depth, this versatile unit accommodates 49" to 56" O.D. rolls having neck diameters 12" to 46", and face lengths 42" to 98".*

THROUGHOUT the steel industry Selas GRADIATION® heat processing is used advantageously in many operations. The versatility and adaptability of the GRADIATION principle are demonstrated by the diversity of applications shown in the installation photographs on these pages.

GRADIATION is the modern concept and technique of economical heat processing which coordinates fast, controlled heating with the nature of the workpiece . . . considering its composition, size, shape, heat transfer characteristics . . . to develop desired product quality and physical properties in minimum time, with maximum efficiency, utilizing automatic, compact equipment.

Designed and custom-built to meet your specific heat processing needs . . . for hot working . . . annealing and galvanizing . . . tinning . . . heat treating heavy sections and special shapes . . . GRADIATION equipment assures high production rates, minimized handling, upgraded quality, and economical utilization of floor space.

At your convenience . . . without cost or obligation to you . . . a Selas field engineer would welcome the opportunity to survey your needs. For this personal service—or for a copy of our new Bulletin "Selas GRADIATION Heating in the Steel Mill"—contact our Steel Mill Division Office, 300 Mt. Lebanon Blvd., Pittsburgh 34, or our Furnace Division, Dresher.

GRADIATION and DURADIANT are registered trademarks of Selas Corporation of America.

SELAS CORPORATION OF AMERICA
17 Dreshertown Road, Dresher, Pa.

EUROPEAN SUBSIDIARY: Selas Corporation of America, European Div., S.A., Pregny, Geneva, Switzerland. **INTERNATIONAL AFFILIATES**: FRANCE—Societe Exploitation de Produits Industriels, Paris; JAPAN—International Machine Co., Ltd., Tokyo.

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VANADIUM CORPORATION OF AMERICA
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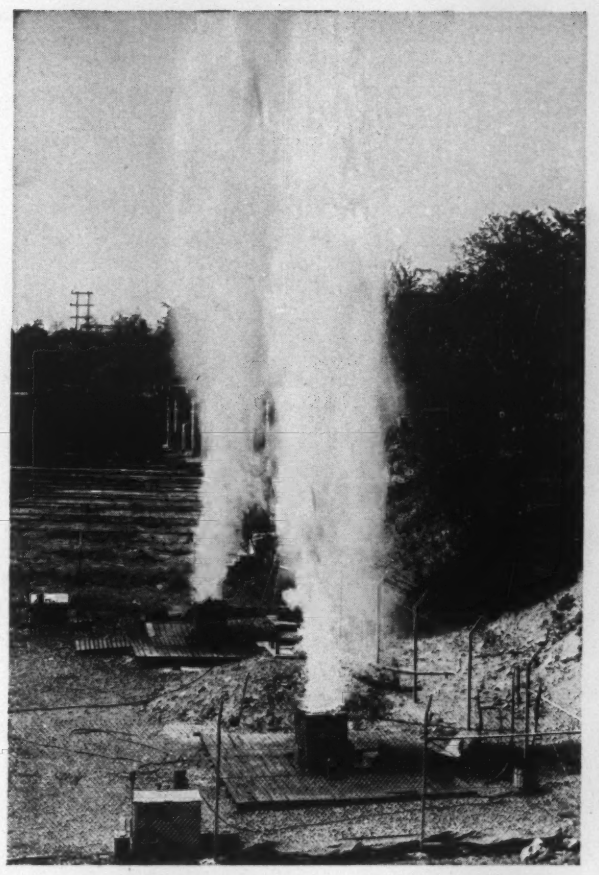

how Parish ingenuity reduced a forming operation to 1/1,000 of a second!

Operator removing an outer warhead shell formed and shaped by explosives.

problem: How to reduce the time and cost involved in forming large aluminum alloy missile warheads.

solution: Parish research engineers reduced the forming rate of aluminum inner and outer warhead shells to 1/1,000th of a second with explosives. A split die equipped with vacuum seals and an open top was used, with water serving as a transmitting medium for the Primacord explosive. Parish ingenuity dramatically reduced forming rates while keeping springback and work hardening to a minimum.

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Write for your copy of this illustrated booklet describing the diversified facilities available to you at Parish.

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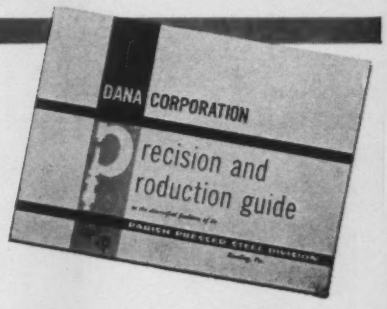

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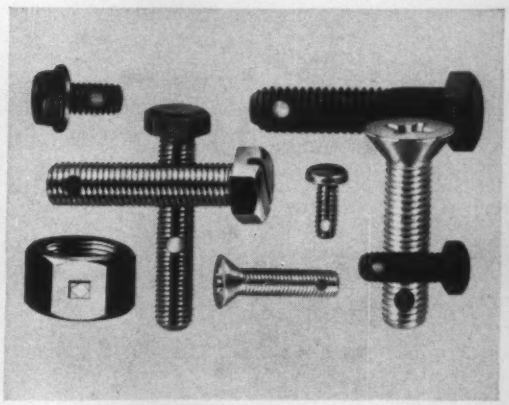

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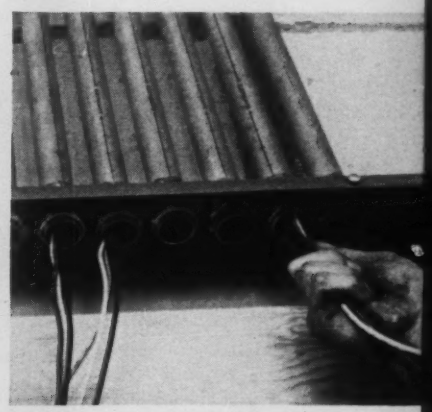

REPUBLIC ELECTRUNITE® E.M.T. ELECTRICAL METALLIC TUBING has cost-saving installation advantages that make it possible to install *in the next larger size* at no greater cost than threaded conduit. It's the economical way to provide extra wiring capacity to meet tomorrow's greater electrical needs. Data supplied through your Republic distributor, or send coupon.

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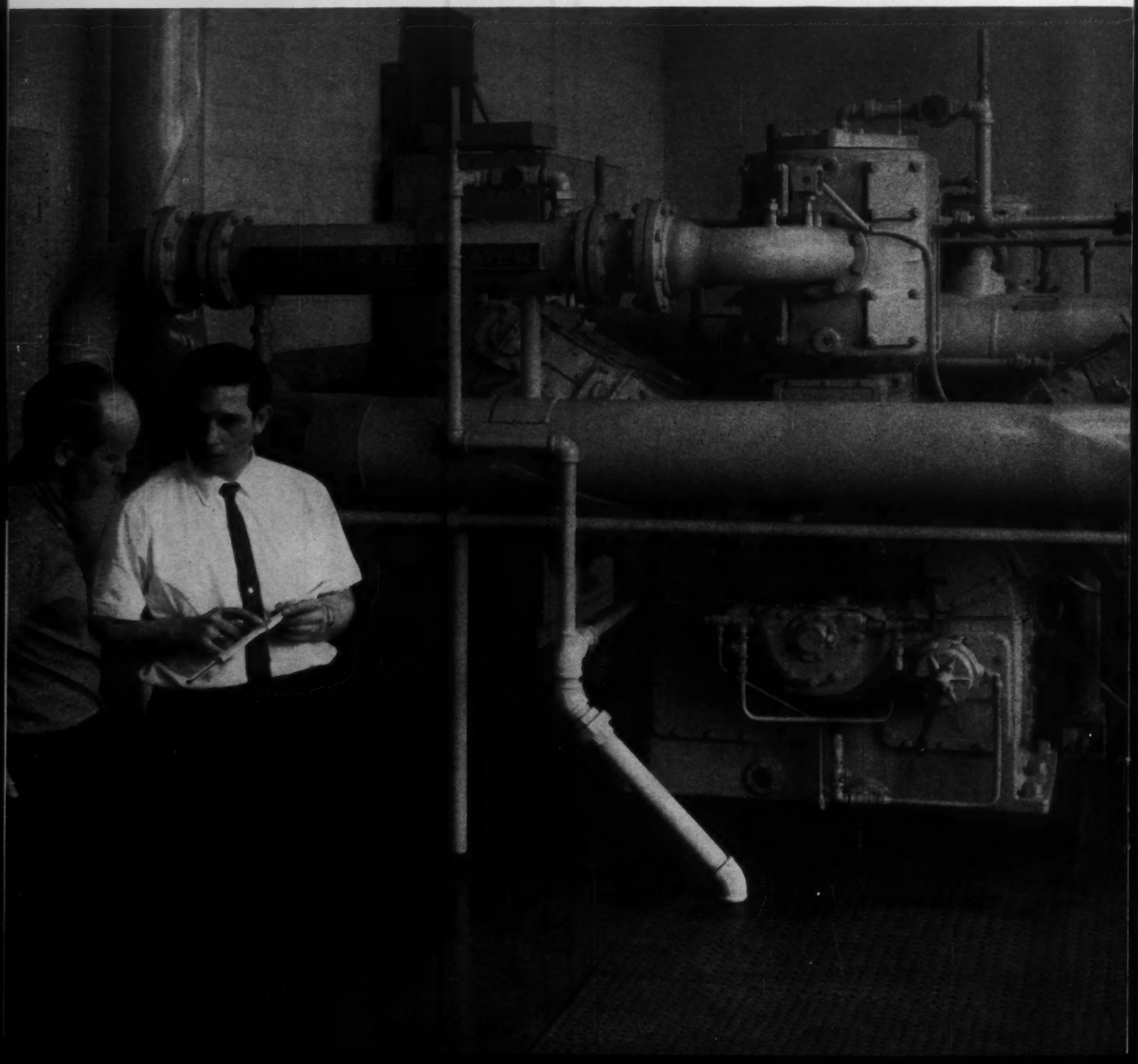
How DMR Air Compressors boost

Users everywhere report important economies by stepping up compressed air capacity with the new Cooper-Bessemer DMR compressors. These *compact*, 720 rpm machines, unmatched in reliability, are enabling plants to boost output with air tools and, at the same time, conserve compressor floor space and installation cost. In most cases, these units can be installed in existing space near the production load to minimize housing and piping needs.

The new DMR compressors are completely



your production...cut floor space needs

equipped with integral motor drive and intercooler ... ready for operation. Their En-Tronic control, also integrally mounted, automatically regulates the compressors to meet the demands of the air system. They are available in 2 or 3 cylinder designs, 150 to 400 hp, 698 to 2005 cfm at discharge pressures up to 125 psi.

For full particulars, call the nearby Cooper-Bessemer office or air compressor agent. Write for Bulletin 94 on the new DMR line.

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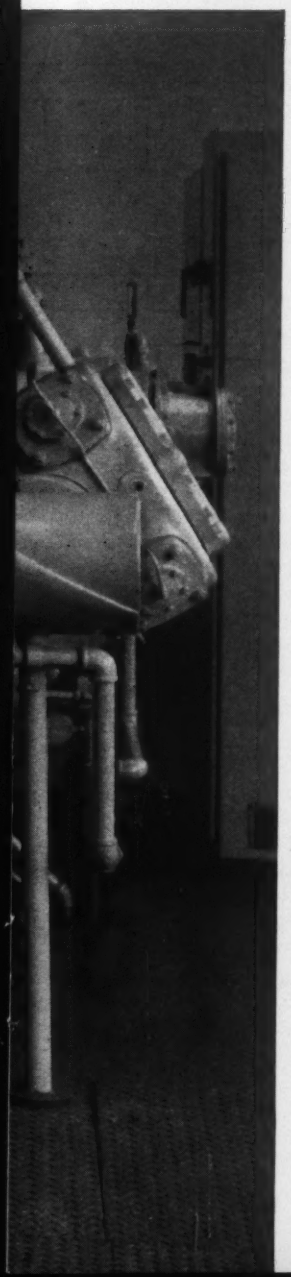
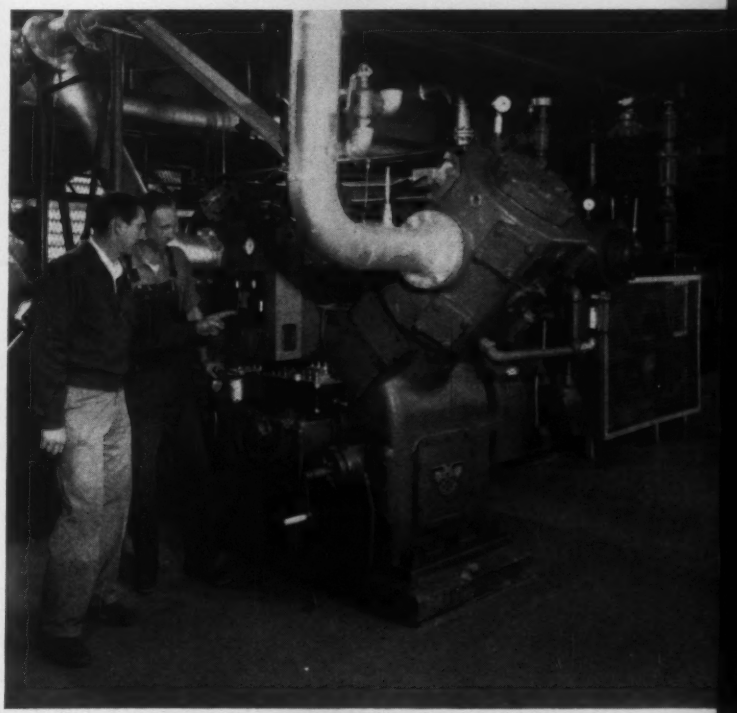


IN A FOUNDRY

... This Cooper-Bessemer DMR-3 air compressor delivers 1658 cfm for portable tools in a Pennsylvania foundry.



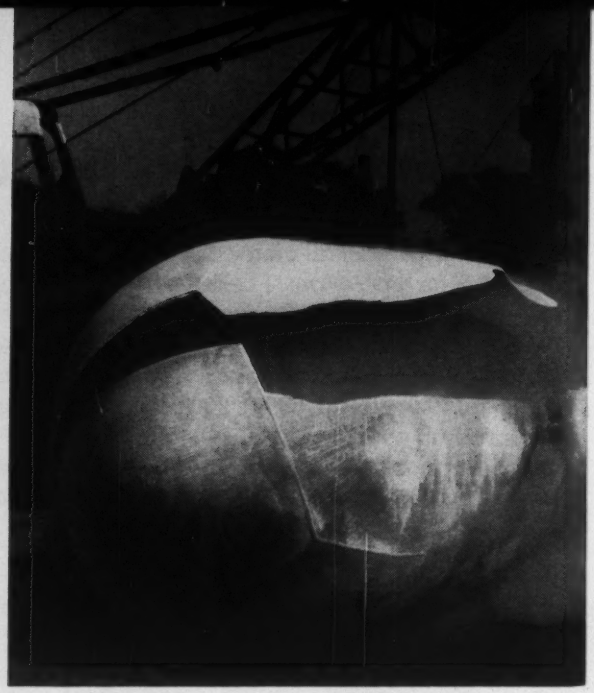
IN A FABRICATING PLANT

... This Cooper-Bessemer DMR-2 compressor supplies 757 cfm air at 125 psig pressure for portable tools.

COMPLETE INFORMATION

on the new line of compact DMR compressors is given in this booklet... free on request. Ask for Bulletin 94.

Burst-test for cylindrical-pressure vessels fabricated from USS 9% Nickel Steel, cooled to —320°F, then pressurized to bursting. This one was quenched and tempered—not stress relieved.



Same vessel after bursting at a pressure of 2,160 psi—almost 6 times the design pressure of 370 psi.

Operation Cryogenics—Success story of USS

Destruction tests on welded tanks holding liquid nitrogen prove that vessels made from quenched and tempered or double normalized and tempered 9% Nickel Steel, *without* post-fabrication stress relieving, equal—and often exceed—the performance of vessels made of the same steel, which are stress relieved after fabrication.

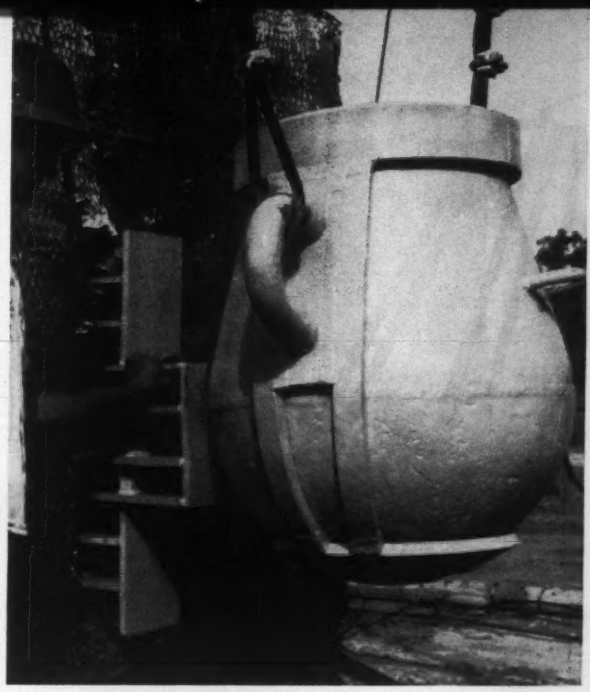
Recently, a series of impact and burst tests, known as "Operation Cryogenics," were performed on 9% Nickel Steel pressure vessels at the Fairless Works of United States Steel. The science of cryogenics, involving the development and practical utilization of materials in extremely low-temperature service, has assumed major importance in industry and in national defense. Much preliminary and advanced development work has been done cooperatively by The International Nickel Company, Inc., The Chicago Bridge & Iron Company, and United States Steel Corporation.

Objectives of "Operation Cryogenics" were to demonstrate (1) the suitability of 9% Nickel Steel, quenched and tempered or double normalized and tempered, in the as-welded condition (not stress relieved), for very low-temperature use; (2) the excellent properties of quenched and tempered 9% Nickel Steel; (3) the ductile behavior of 9% Nickel Steel in the as-welded condition during enforced failure at very low temperature; (4) the behavior of 9% Nickel Steel in the stress-relieved condition for very low-temperature use.

Test conditions: Two basic types of vessels were tested—rectangular vessels 8 feet square and 6 feet high simulating a type that might be used for shipboard transportation of liquefied gases, and cylindrical vessels 4 feet in diameter and 13 feet long with hemispherical heads such as are used for land-based storage and transportation of liquefied gases. All vessels were welded from economical 9% Nickel Steel plate ⅜" thick, from the same heat of steel.

A total of nine vessels was built for the test. Five were made from 9% Nickel Steel plates and forgings in the quenched and tempered condition (QT) and four in the double normalized and tempered condition (NNT). Further, six of the vessels were tested as welded (AW), without any heat treatment after fabrication. Three were stress relieved (SR).

Impact test results. Impact testing of the three rectangular vessels, refrigerated with liquid nitrogen to –320°F, illustrated that 9% Nickel Steel vessels are capable of undergoing extensive plastic deformation even at extremely low temperatures. The vessels were repeatedly impacted both under pressure and without pressure by blows exceeding 80,000 foot-pounds. One quenched and tempered vessel did not fail, despite 7 impacts. Results clearly indicated the ability of quenched and tempered 9% Nickel Steel vessels in the as-welded condition (not stress relieved) to withstand impacts far beyond any which are likely to occur in service.



4340-pound wrecking ball used in striking rectangular vessels from varying heights.

Impact Test—Rectangular vessel of 9% Nickel Steel quenched and tempered but not stress relieved, refrigerated to —320°F. Withstood severe impact of 82,460 foot-pounds and did not fracture, proving superior strength and toughness of the steel.

9% Nickel Steel Tanks punished at -320°F.

Burst test results. The cylindrical vessels were designed for 370 psi internal pressure (hoop stress in shell equal to 23,750 psi). These vessels were refrigerated to -320°F with liquid nitrogen and pressurized to failure. *The burst pressure for all vessels was at least four times the design pressure of 370 psi and one of the non stress-relieved vessels didn't burst until 2,300 psi.*
(See Table I)

These tests prove that USS 9% Nickel Steel has the high strength, toughness, and weldability needed for low-temperature pressure vessels.

We urge you to consider USS 9% Nickel Steel for economical low-temperature vessels. For the complete story, write to United States Steel, Room 6211, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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BURST TESTS 9% NICKEL STEEL CYLINDRICAL VESSELS

	PC-1	PC-2	PC-3	PC-4	C-5	PC-6
Heat Treatment	QT	NNT	QT	NNT	QT	NNT
Test Condition	AW	SR	SR	AW	AW	SR
Temp of Vessel (°F) at start of test	—308	—320	—320	—320	—320	—322
Temp. of Vessel at Failure (°F)	—304	—320	—311	—310	—302	—314
Burst pressure (psi)	2,275	1,550	2,125	2,300	2,160	2,100
Burst stress (psi)	135,510	92,920	129,800	135,730	132,500	129,100

TABLE I. Complete data are shown for burst testing of the cylindrical vessels. In each test, the vessel was filled with liquid nitrogen, supply valves were closed, and pumping continued to build up pressure to bursting point. The data show quenched and tempered (QT) or double normalized and tempered (NNT) vessels in the as-welded (AW) condition withstood greater burst pressures and stresses than did the stress-relieved (SR) vessels.

IMPACT TESTS 9% NICKEL STEEL RECTANGULAR VESSELS

	PR-1	PR-2	R-3
Heat Treatment	QT	NNT	QT
Test Condition	AW	AW	AW
Impact number	#9 of 11	#5 of 6	#7 of 7
Vessel Temp. (°F)	—293	—317	—308
Height of Drop, ft.	19	19	19
Kinetic energy of 4340 lb. weight (ft-lb)	82,460	82,460	82,460
Impact Velocity of 4340 lb. weight (fps)	35	35	35
Vessel pressure before Impact (PSI)	106	100	0
Total indentation after test (inches)	2.44	1.38	3.38

Table II. Data are shown only for the impacts which resulted in cracking or fracture of vessels PR-1 and PR-2. The two vessels were subjected to repetitive tests under increasingly severe impact and pressure conditions, leading up to the test which finally enforced failure. Additional impact tests were conducted on the failed vessels to determine further distortion and dimensional effects. For vessel R-3, which did not fail, data are shown only for the last impact.

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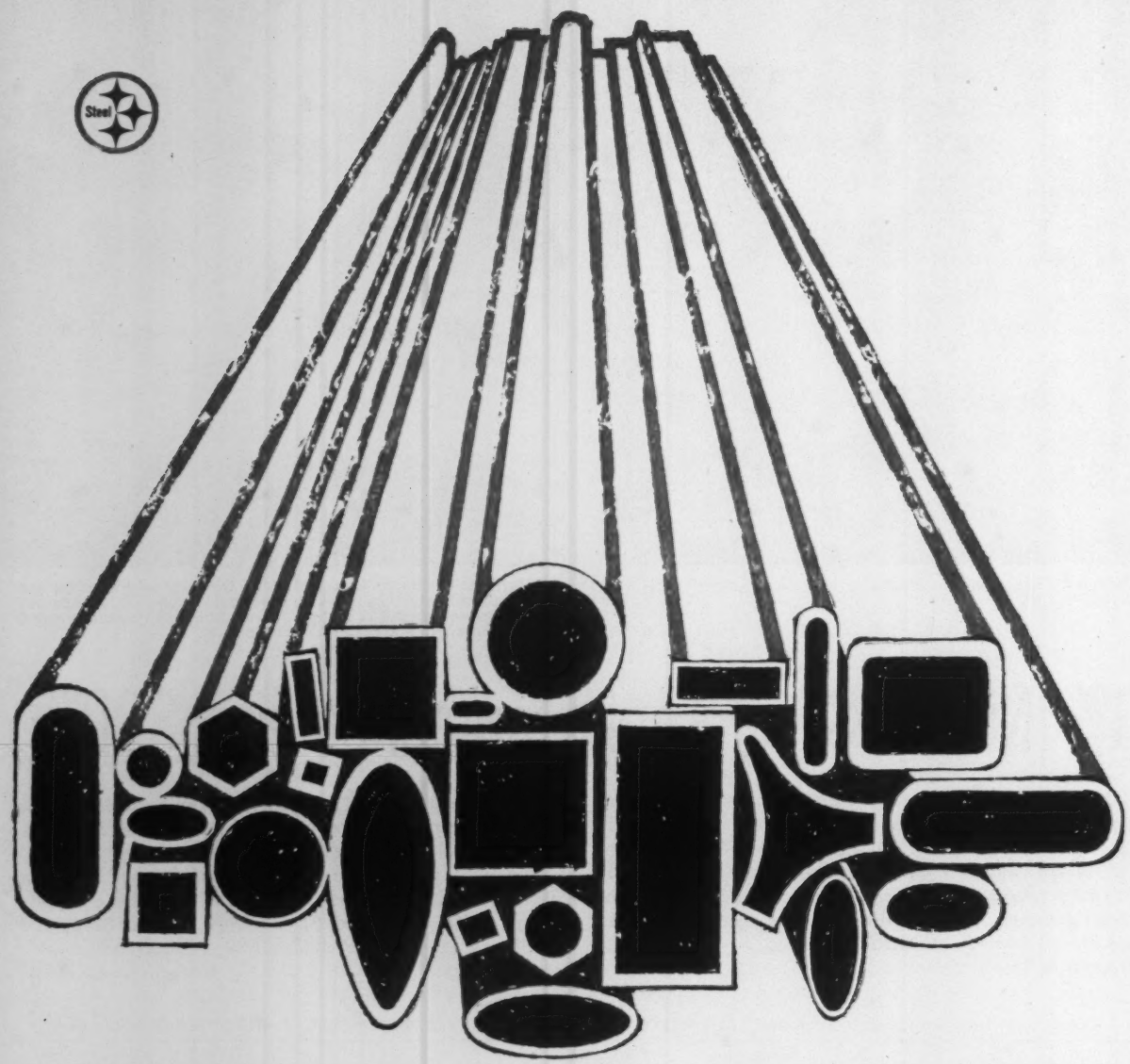
United States Steel



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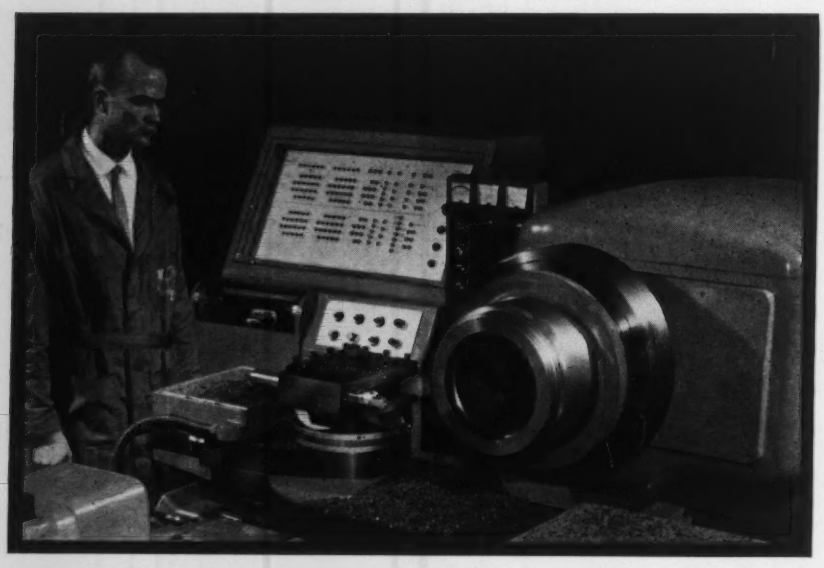

Where lathes are concerned, the economics of Numerical Control require the consideration of these factors:

1. The number of individual jobs to be run.
2. The complexity of work piece geometry.
3. The allowable time lag between completion of drawings and completion of machining.

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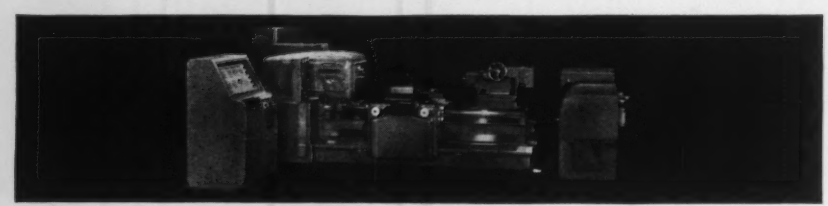
- Programming can immediately follow completion of drawings. No long wait for templates or other special tooling. Storage of tape for future use easier, safer and less space consuming than templates.

We believe that a successful Numerical Control Lathe combines machine and control that have been *properly matched* by the machine tool builder to the specific requirements of the job. Response of the control must be such that the machining capacity of the lathe is not limited; accuracy of the lathe such that the full accuracy of the control is realized. The Pathfinder Numerical Control Lathe is such a combination.

Ask us to evaluate whether a standard lathe, tracer control or numerical control is best for you. We offer all three. For over 50 years our engineers have specialized on fitting lathe to job for user profit and satisfaction. The MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.



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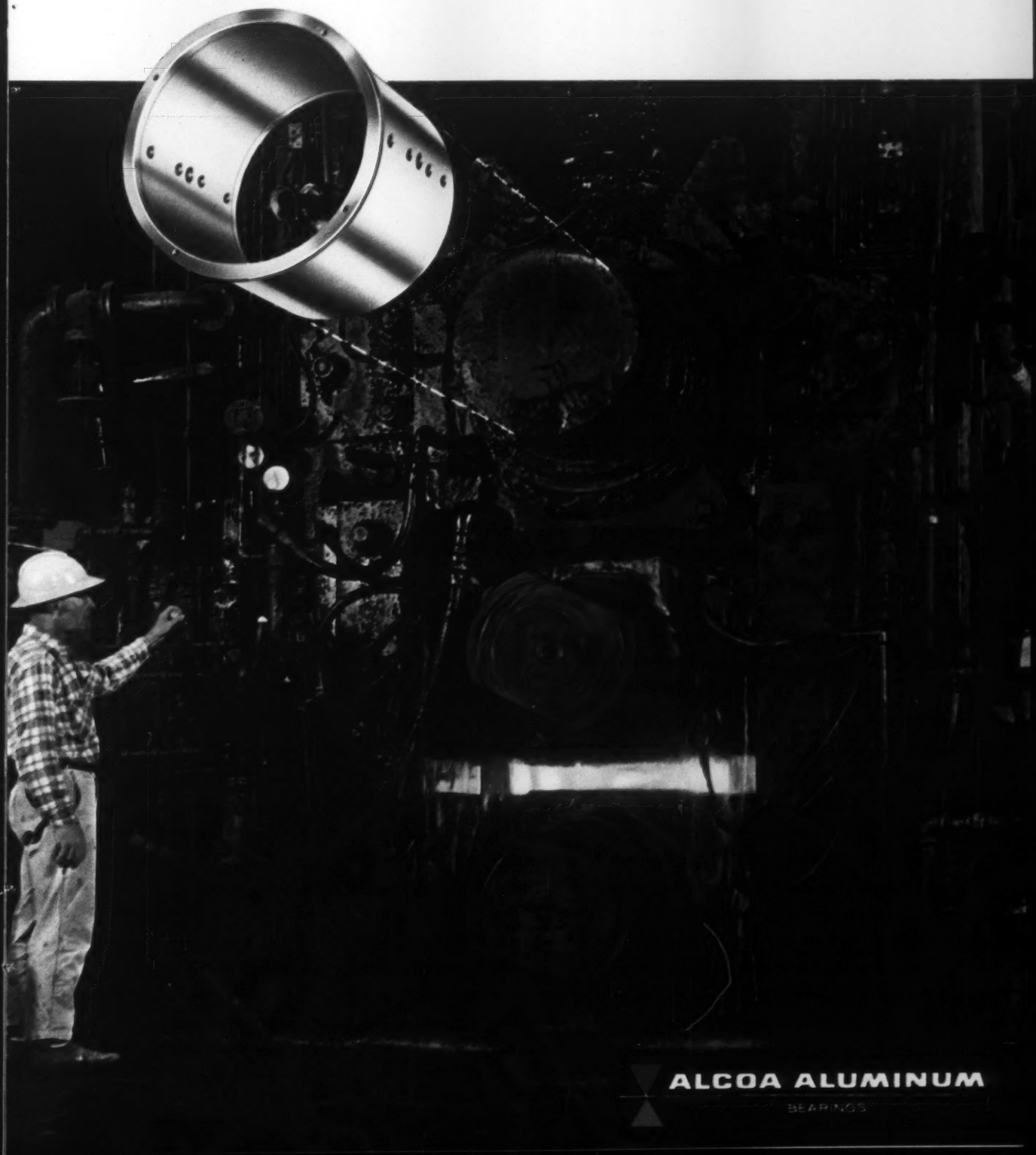
When an aluminum bushing takes a 5-million-pound load...

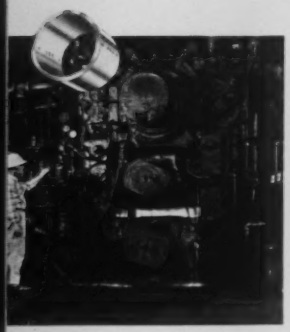


ALCOA ALUMINUM

BEARINGS

When an aluminum bushing takes a 5-million-pound load...

that's Alcoa Total Ability at work!



And when tandem cold mills roll steadily at 5,000 fpm, that's even more impressive! Yet, this is only par for the course with aluminum. In steel mills both here and abroad, aluminum bushings have proved themselves in the most exacting applications. Laboratory tests prove that aluminum bearing alloys carry *higher unit loads at higher speeds than any other material.*

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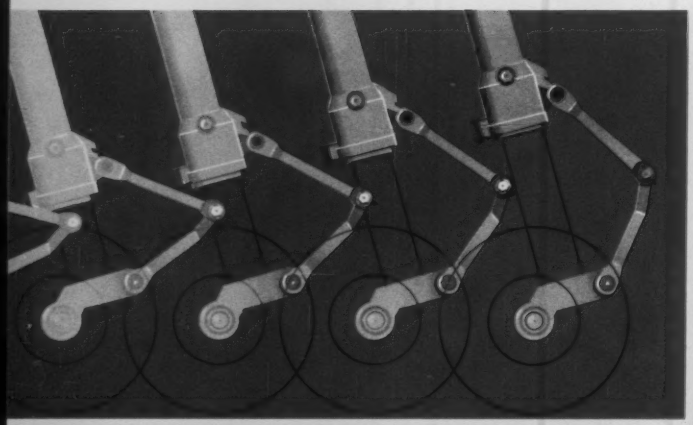
No one knows more about aluminum bearing alloys than Alcoa. And *Alcoa Total Ability* means you get direct help—whether you're designing a new bearing, bushing . . . or placing a finished unit in the line. For details, call your nearest Alcoa sales office. Or write: Aluminum Company of America, 855-G Alcoa Bldg., Pittsburgh 19, Pa.

ALCOA ALUMINUM

BEARINGS



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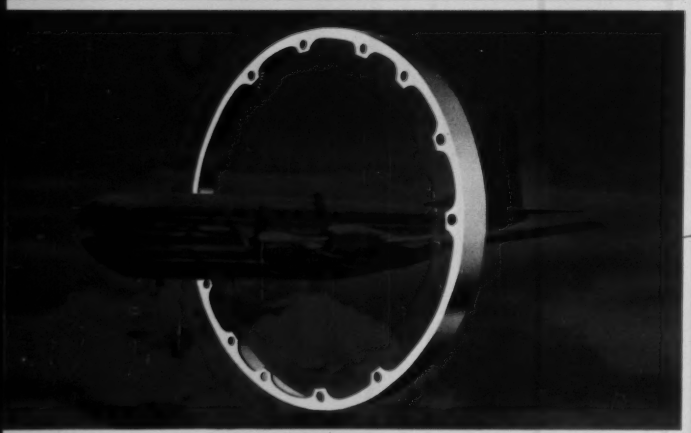

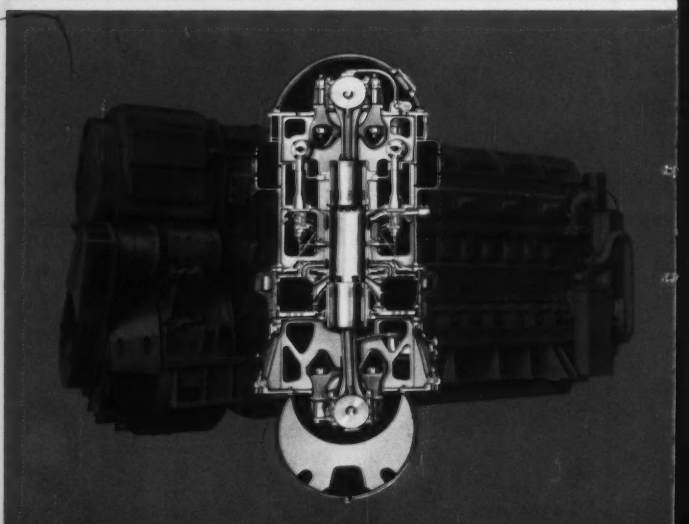

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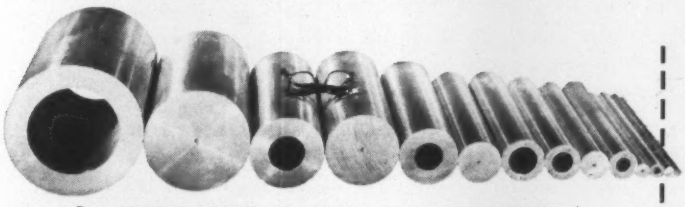

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AUTO SALES OF 6 MILLION UNITS THIS YEAR are still possible. Including foreign cars, some 2,950,000 units were sold in the first six months. Industry executives expect as many sales in the last half of the year. Output, however, will trail 1960. Through mid-July the industry turned out 2,950,000 cars compared with 4 million in the same period in 1960.

SEVERAL METALWORKING PLANTS will be among the first area redevelopment projects now being readied in Washington. The projects will get financial action within the next few weeks.

FINAL DECISIONS ON THE CAPITAL OUTLAY PROGRAM of $250 million reported for Jones & Laughlin Steel Corp. are expected in a matter of days. The company has already placed engineering contracts for portions of the hot strip mill modernization in Cleveland. The need to supply sheet in large coils is one reason for the strip mill program.

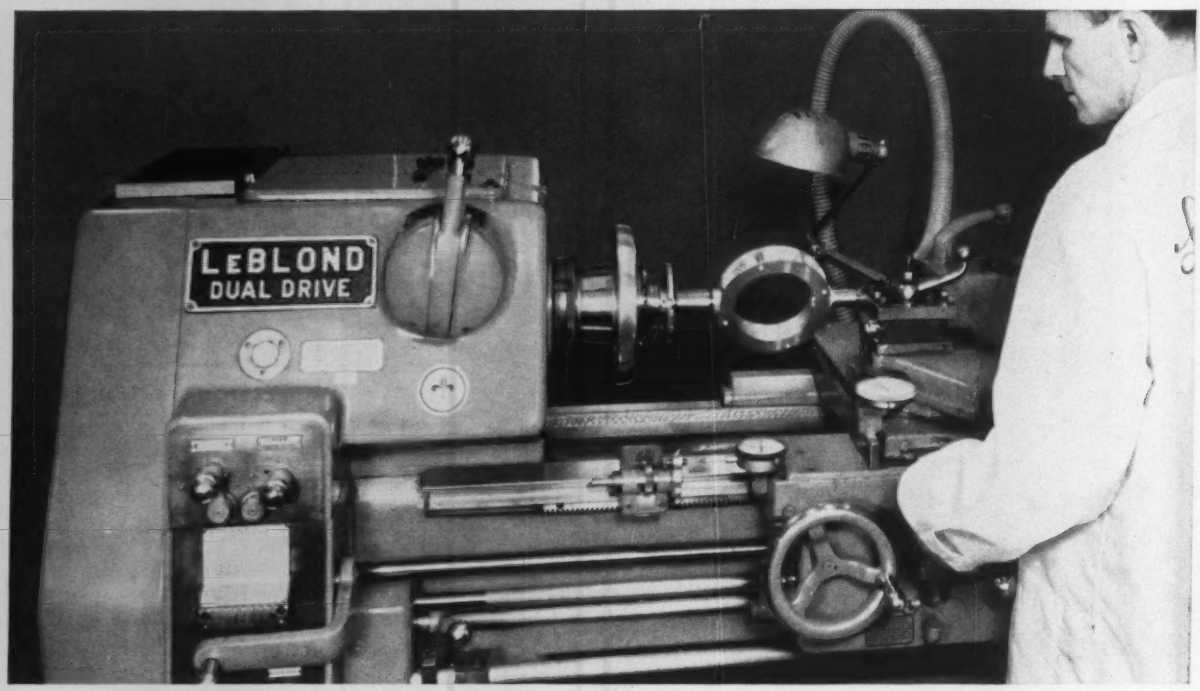
METAL CAN SHIPMENTS for the first five months of this year were up 2.8 pct over the same period in 1960. Steel consumed in the cans shipped totaled 1.7 million tons, up about 3 pct over the first five months last year. For the same period, 15.6 thousand tons of aluminum were used.

"PACKAGED" PLANTS HAVE A READY MARKET in foreign areas. Many foreign businessmen claim American specialization requires them to buy and assemble machinery from several U. S. manufacturers to get a plant operating. U. S. companies that are making equipment, installing it, and initially running entire plants for foreign businesses are reportedly doing very well.

GRAY IRON FOUNDERS report operations were at 67 pct of "ideal" capacity in June. This compares with a 71 pct rate in May. The data is based on a survey of 164 foundries by the Gray Iron Founders Society. Ninety-five see lower shipments for July, due largely to vacation shutdowns. But 48 expect more shipments.

A GENERAL HIKE IN BEARING PRICES has been scheduled for August 1 by Timken Roller Bearing Co. In the first general hike by Timken in four years, all but railroad bearings are affected. Increases are laid to cost pressures. Unusually good July orders indicate the move may have sparked price hedge buying.

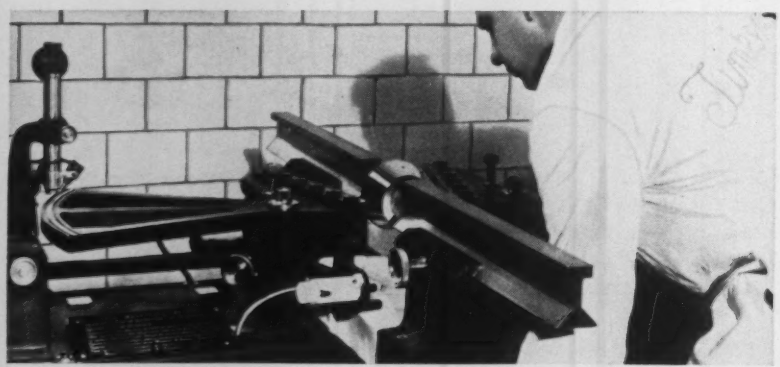
LeBLOND with special Timken® "00" bearings ...spindle runout less than .000025″



To give a customer a special, new high in precision in its 15″ Dual-Drive lathe was the problem for LeBlond engineers. The customer's product was a super-precise beryllium gyro float assembly. Diameter of the sphere: 1.8750″. Work specifications called for the spherocity to be held concentric with the two major axes within .0005″ total indicated runout.

To meet this, LeBlond specified Timken® super-precision "00" tapered roller bearings held to .000025″ assembled runout—one-third the normal runout tolerance. Timken bearings were also used on the intermediate, back and feed shafts of the drive. The assembled spindle runout (total indicator reading) was actually less than .000025″.

Producing super-precision bearings like this is typical of Timken Company service. The kind of service that developed Timken "00" bearings to meet industry's needs for ever-greater precision. It's another example of the Timken Company's leadership in tapered roller bearing design and manufacture.



ACCURACY IS ASSURED for Timken "00" and *all* Timken bearings by our modern gage laboratory, one of industry's finest. Some instruments we use are capable of comparing sizes to .0000005″. Such precision is another reason why American machine tool manufacturers prefer Timken tapered roller bearings.

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The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.

South America: Time of Change

Can Progress Come Out of Period of Confusion?

Nations to the south of the U. S. are undergoing change. And the situation calls for a new approach by U. S. businessmen.

Here's an on-the-scene report of a continent in confusion and a hint of what's needed to stay in business there.
By Tom Campbell

■ Venezuela is the South American pilot plant for the "new" democracy. What happens there will affect profoundly the whole trend in the Latin Americas.

Once our closest friend—and next to Canada our biggest customer—Venezuela has changed. The changes are similar to the vague trends in Brazil, Peru, and in Argentina.

The changes are not necessarily due to U. S. blunders alone: Landed gentry of South America must take much of the responsibility. The rest goes to the Communists who have been busy in Latin America for years.

Opportunity, But—In the meantime the revolt of the masses has spread—and will spread and change the climate further for North Americans. Vast changes are taking place in various political parties in Venezuela and in other South American nations.

One thing is certain: There is no room in South America for the foreign businessman who wants to make a quick killing. He just won't get far. But there is still opportunity for foreigners who want to make partnership with those in South America, who will take a risk, and who have faith in the country's future progress.

No Opportunists — But before leaving for Latin America right away, the bad news should be digested. South America today is not for the blunt, hard-bitten America-firster. It is not for those who are used to throwing their weight around. And it certainly is not for those who want yesterday the solutions to problems that possibly have no solutions.

There will be no easy road to orderliness and stability in South America. The pains are just beginning in the pilot nation of Venezuela. There, after three years of nothing much doing—except for Romulo Betancourt finding out that being President is far more complex than being an exiled politician—confusion abounds.

Confusion Is "Normal" — But that confusion is "normal," considering what Venezuela and other Latin nations are trying to do. Here is why the American businessman should be one who knows frustra-

Violence Contrasts With Progress in Venezuela

SIGNS OF THE TIMES: These photographs taken by Tom Campbell show bombed car outside of plush Tamanaco Hotel in contrast to orderly dock at steel mill near Puerto Ordaz. Mill is behind schedule, however, and U. S. technicians were called in to complete construction, straighten out production, management.

LATIN RELATIONS: Venezuelan president Romulo Betancourt (left) and United States U. N. ambassador Adlai Stevenson met in Caracas recently at the start of the U. S. representative's South American tour.

tions, outrage, comic relief, basic human drives, hard work, and years of working for what he believes can be accomplished:

1. Oldtimers who favor dictatorships have been impatient because democracy, they say, has not worked out—just as they said it would not work.

2. Young professional and engineering men educated in the States are impatient because democracy has not worked. They want faster results and they want more social benefits.

3. The average poor farmer or worker has so many problems in just living that he wants something better than what he has. But he has not fallen for the Commie line. Nor is he too interested in Castroism.

But There Is Hope—When you add that up you have stagnation, mountains of work to be done, and an appearance of nothing happening. The diehards think a new revolution is afoot. The professionals say there isn't a chance of another dictatorship because "the people are not afraid to die from army bullets."

Yet in the midst of all this there is hope that Venezuela, Brazil, and Argentina will "some day" come to the point where there will be less confusion, more foreign investment, less government meddling, and an attempt to eliminate white elephants foisted on the people by dictators, greedy businessmen — and politicians ignorant in business and in financial ways of running a government.

A Bright Light—That day will be a long way off. There is still the view that the government should own and control power plants, transportation, steel plants, and petrochemical plants. True, foreigners are hired to run these plants at first. True, foreigners are brought in to unscramble previous scrambles and blunders. But in the end, the governments in power and the young engineers and professional people favor the government's handling or controlling the projects.

Yet in the midst of this doomsday type of news—which is confirmed everywhere in Venezuela, Brazil and Argentina—there was a bright light a few weeks ago. Venezuelans were surprised when they read in their papers that Standard Oil of New Jersey's well-run Venezuelan subsidiary, Creole Petroleum Corp., was ready to loan out $10 million for strictly Venezuelan projects.

Cheers, Not Jeers—Not only that, but a pattern was established: The projects would not be related to oil; Creole would be a minority interest along with Venezuelans; the new formation would be a subsidiary of Creole Corp.

The ground rules for loans caused the emotional Latins in Caracas to rise from their chairs in a chorus of "Bravos!" Here they are:

1. The project must be necessary for the nation.

2. It must provide employment for Venezuelans.

3. It must use Venezuelan raw materials.

4. It must be reasonably sound project financially.

5. It must have or produce foreign exchange.

A Few Points — Following a meeting of about 100 businessmen and bankers at which Creole's president Harry Jarvis unveiled the plan, confidence in Caracas rose a few points. This is something that hasn't happened in months on end.

The plan will enable companies needing funds for new plants and expansions to apply for help if they can meet the requirements above. Agriculture and live stock projects will also be considered.

A Fact of Life—Creole has caught the future thinking of those who will guide South American destiny as far as business is concerned. This company well knows that nationalism is a fact of Latin industrial life.

Exploitation of raw materials, workers, projects and changes in Latin American nations is to be: For South Americans, by South Americans — and probably for some time directed by government. The alternative, at present, is a further deterioration aided and abetted by Castro and infiltration by Communists.

Uranium Retains Its Markets

Production Assured Through 1966

Rated a declining giant among U.S. industries, uranium remains big business.

New AEC contracts indicate an annual rate of 16,000 tons over the next five years.
By K. W. Bennett

■ Uranium is still big business.

In 1959, the U. S. Atomic Energy Commission purchased 15,126 tons of domestic ore concentrate. In 1960, this figure jumped to 16,550 tons. And it will reach 17,006 tons this year.

Present AEC plans call for a relatively high level of domestic uranium purchases into 1966. It should hold at 16,000 tons-per-year through 1965. And foreign buying will be curtailed.

Market "Floor" — The uranium market, thus, is guaranteed a production "floor" for the 1962-65 period that tops its best pre-1961 production. If the spectre of all AEC contracts ending in 1966 haunts producers, it's the same kind of deadline they have lived with for years on contracts that will expire in 1962.

AEC operates $7 billion in equipment built around uranium processing or manufacturing facilities. About 360 U. S. ore producers feed 26 mills, valued by the AEC at $144 million, and by others in the industry at $160 million.

Price Drop — There have been suggestions of a price cut, from the present $8.41 per lb to $8.00 per lb. Says one producer, "That's a cut, but we'll go all the way until our contract runs out, and we'll make money at that price."

U. S. ore producers have developed lower cost uranium recovery methods than foreign competitors. On negotiated AEC sales, U. S. producers say they've sold concentrate at well under $8.40 per lb, at a profit.

And U. S. uranium deposits average 5 lbs of metal per ton of ore, compared with averages as low as 2 lbs in other countries.

Few Left Out—In new AEC contracts, it appears few domestic producers are being left out.

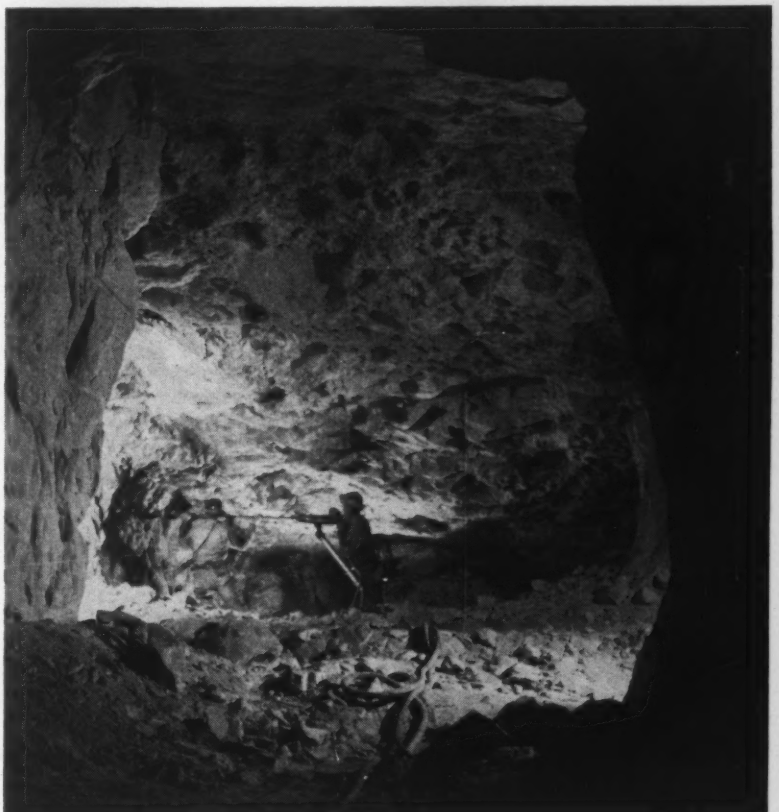
Two milling concerns were hunting ore suppliers last week. Susquehanna Corp. has brought in a $2.5 million plant, rated at 250 tons of ore concentrate per day. And Union Carbide Corp., operating four mills, has two contracts valued at $100 million.

Future Uses—Technological advances could bring new uses for uranium.

Through 1966, 2000 tons of the 16,000 tons of ore produced annually will go to civilian atomic power plants, and for mobile reactors.

There's a big gap in uranium requirements for this market after 1966. But reactor requirements are rising at a startling rate.

Electric power generating reactors consumed about 100 tons of ore in 1960. This should double in 1961. By 1965 it could reach 1000 tons annually, according to some government spokesmen.



URANIUM ORE: New contract between the AEC and Union Carbide Nuclear Co. assures a market for uranium ore through 1966.

Aerospace Buying Tightens Up

Top military and industry executives of the aerospace industry met in Detroit.

Drastic revisions in buying policies were outlined. And all looked ahead to even tougher controls and rapid changes.
By R. H. Eshelman

■ Aerospace procurement methods are again undergoing drastic revision. That's the word from a high level open meeting of industry and government officials in Detroit.

Doing business with the government has never been easy. It's not likely to become much easier in the future, some top officers confessed. Reason: Complexities of the atomic-space age.

Rapid Changes — Technological changes cause plans to be altered, often before they are much more than well formulated.

Rapid pace of scientific and technological advance also causes obsolescence in modernization programs, which is costly.

The conference, sponsored by the Michigan Aeronautical & Space Assn., had as speakers over 50 of the nation's top missile and space experts. They included 16 presidents and eight vice presidents of missile and space companies; six generals; four admirals; and many other top officials.

Rule for Decade—According to Lt. General Mark E. Bradley, Jr., deputy chief of Air Force staff for materiel, "In terms of procurement of AF weapons systems and support, 1971 is just around the corner. Procurement policies being put into practice this year will probably be our guidance for the next ten."

Air Force requirements in the next decade cover manned aircraft, missiles and space systems. He called for: 1. A clearer statement of requirements and specifications, and more clearly stated performance goals; and, 2. Study of fixed price contracts, and emphasis on earned gains in incentive contracts, not windfalls.

He indicated that more vigorous competition will be encouraged in many areas, in a drive to streamline programs and reduce costs.

Strategic Status—America's newest four star general, B. A. Schriever pointed to the high potential space offers to strengthen strategic position. This applies to warning, communications and observation areas.

He predicts new management and organization techniques in military research and development.

"Production is becoming more and more closely linked with development," he says. "The 'technological explosion' of the last two decades has produced a new industrial environment."

Man in Space—Future military use of space may aim at putting the man in control, military men emphasized.

Developments, and even new concepts, are needed to enable space pilots to navigate and maneuver, de-orbit and land. New systems will also be needed for rendezvous in space, probably with space stations, manned and unmanned.

The immediate military objective will obviously be to increase the ability to reliably place large payloads in orbit.

Polaris Subs—In the missile field, Vice Admiral W. F. Raborn, director of special projects, reported that the Polaris system will be expanded to a production of one sub a month by 1963.

Success of the Polaris program is attributed again to streamlined management. A new program evaluation review technique, using electronic data processing, speeds decision making.

Future design and material requirements will have to pass close appraisal before procurement okay, other Navy spokesmen said.

Buyers will probe requirements for the weapons systems and sound operational concepts. They will be stacked against best intelligence esti-

SPACE RACERS: Top missile and space experts discussed buying policies and changes to come at a Detroit conference. Left to right are T. F. Morrow, vice president, defense production, Chrysler Corp.; C. A. Brady, general manager, Chrysler Missile Div.; and Vice Admiral W. F. Raborn.

mates and competitive systems.

Feasibility or practicability in the field will be other yardsticks applied. Economy, both of first cost and operation, will be stressed.

Business Role—What will be the role of small business in this era of technological production?

Some prime contractors gave a partial answer: Probably as subcontractors and suppliers of smaller, less complex items.

Army Ordnance stresses that its policy is to increase participation of small business, especially in labor surplus areas. It has a goal in the next fiscal year of increasing by 10 pct components for small business contracts. It also will make available drawings and specs for competitive bidding. And prime contractors will be encouraged to subcontract when feasible.

Value Analysis—Cost reduction, and the twin problems of quality and reliability, will be in even sharper focus in the future. "Value engineering" will be emphasized with increasing frequency.

Industry will also seek ways to prevent and eliminate red tape procedure, especially in space programs. But the need is to utilize scientific-oriented technical specialists to a greater degree, in negotiating and contract activities.

Depressed Areas — The Martin Co. spokesman, J. H. Bennet, noted that his company, producer of the Pershing Missile System, in the past two months has placed $11.5 million subcontract orders in labor surplus areas. Over 100 contracts were placed in Michigan in May alone.

What is looked for in a subcontractor? The prime contractor is primarily interested in getting the most reliable and best component for the job at the lowest cost, delivered on schedule.

Looking Ahead—To stay in this business in the future, a company must be somewhat clairvoyant. It must find a way to determine what is going to be needed and bought.

This calls for continued analysis and research.

Youngstown Bets Big On Area's Future

Youngstown Sheet & Tube has completely revamped its hot-strip mill and added a big new annealing department.

It represents a $60 million investment to capture more auto business in northern Ohio.

■ Despite gloomy reports from Youngstown during the 1960 slump, the district's largest steel producer is not worrying about its future. "This area," said A. S. Glossbrenner, president of Youngstown Sheet and Tube Co., "is far from dead!"

WATKINS: "We can deliver."

Last week he showed how Sheet and Tube had bet $60 million on that future. It opened for inspection a completely revamped 79-in. hot-strip mill and a brand new 50-furnace annealing department.

Aimed at Autos—Detroit's Big Three have been expanding stamping plant activity in nothern Ohio in recent years. The $60 million program was planned to capture more of this flat-rolled business.

Myron H. Watkins, vice-president, sales, says that the new facilities are already beginning to pay off: "We can now deliver the larger coils (to 38,000 lb by 72 in.) the stampers want. We've improved surface finish by taking a bigger reduction on more stands. And we are able to hold a more uniform gage from start to finish."

World's Longest?—E. O. Reese, district manager of steel operations, says his figures show that the revamped mill is probably the longest in the world, 1411 ft. And perhaps the most powerful, 66,000 hp on its 12 stands.

Since the new setup has more than twice the capacity of the old, Mr. Glossbrenner was asked if he expected it to run full out within the next decade. "We certainly do," he said, "and sooner than that."

Ship to Chicago—One outlet: Shipping its hot-rolled coils to the company's Indiana Harbor plant for cold rolling. A trainload-rate to the Chicago area would make this attractive to the company.

Asked if he saw the new setup as an export aid, Mr. Glossbrenner said no. "I doubt we or any other U. S. mill will be in the export business three years from now. Except for specialties," he added.

Old and New—Slabs for the mill come from three 5-zone reheat furnaces, each 28 by 100 ft. They bring cold slabs to 2400°F in 90 minutes. The mill uses closed-circuit TV, electronic gage control, semi-automatic downcoilers. One nice trick: Old motors are used with new; in one case two existing 3000-hp motors were connected to deliver 6000 hp.

INDUSTRIAL BRIEFS

State Fair—More than 500 exhibitors will participate in North Carolina's first state trade fair at Charlotte, October 12-21. President Kennedy will open the trade event, designed to sell North Carolina products on a world-wide scale. It will be modeled after the famed European trade fairs.

Veteran Honored — Trustees of the National Tool, Die & Precision Machining Assn. paid tribute to retiring George S. Eaton at the summer board meeting. He served 16.5 years as executive vice president and executive secretary of the assn. C. R. Bender was appointed executive secretary.

In One Line—Mathews Conveyor Co., Ellwood City, Pa., has purchased the Wilkie Co., Philadelphia, manufacturer of telescopic roller, wheel and belt conveyors.

Engineering Buy—Coleman Engineering Co., Inc., Los Angeles, has acquired Speed-D-Burr Corp., Wilmington, Calif. The Speed-D-Burr metal products finishing facilities will be doubled to house operations of Coleman Engineering Div., now located at Torrance, Calif.

Stock Sale — American Metal Products Co., Detroit, has acquired Cook & Co., of Arcadia, La., in a common stock agreement. Cook makes parts and assemblies for the farm implement industry.

Broader Base — Hupp Corp., Cleveland, is acquiring Hercules Motors Corp., Canton, O. Hercules makes diesel, gas, gasoline and liquified petroleum gas engines.

Approved Merger—Stockholders of Ling-Temco Electronics, Inc., and Chance Vought Corp. have approved the merger of the companies into Ling - Temco - Vought, Inc., effective August 31. The new corporation will have assets of $194 million and a backlog of unfilled orders totaling $300 million, with headquarters at Dallas, Texas.

Integrated Line — Pheoll Manufacturing Co., Inc., Chicago, has purchased the industrial fastener line of Scovill Manufacturing Co., Waterbury, Conn. It will be integrated with Pheoll's facilities at Chicago and Torrington, Conn.

Division Dispersed — Van Norman Industries, Inc., has sold forging machinery and equipment of the Herbrand Div., Bingham-Herbrand Corp., to American Brake Shoe Co. Herbrand will continue to operate at Fremont, O.

Another Line — Hysol Corp., Olean, N. Y., has bought the epoxy electrical insulation, potting and encapsulation product line of Permacel Div., Johnson & Johnson Co., New Brunswick, N. J.

Controlled Supplies — Spencer Chemical Co., Kansas City, has acquired two suppliers of packaging materials. Crystal Tube Corp., Chicago, and Flexicraft Industries, Inc., New York City, will become subsidiaries of Spencer.

New Assets—Cal-Tech Systems, Inc., Glendale, Calif., has acquired Extrusion Corp. of America, Gardena, Calif. It will be integrated with Cal-Tech's Fullview Div. at Glendale, which can extrude the aluminum used in Exco's line of store front frames.

Carpenter Gets—Carpenter Steel Co., Reading, Pa., is acquiring NTH Products, Inc., El Cajon, Calif. NTH makes thin-wall tubing in many of the newer, specialized metals, such as zirconium, titanium, tantalum, columbium, and special alloys of nickel and iron.

W. German Move—A West German construction equipment manufacturer is forming a branch in the U. S. Friedrich Wilh. Schwing Co. will have its national headquarters at Rockford, Ill., under the name Schwing-American Corp. A related enterprise, AirWay Concrete Placement Corp., is also being set up.

Foil Field — Hydrometals, Inc., New York, is expanding into the metal foil market by acquiring Stranahan Foil Co., South Hackensack, N. J.

Research Deal — Atlantic Research Corp. has acquired National Northern Div., American Potash & Chemical Corp. Located in West Hanover, Mass., National specializes in pyrotechnic research, development and production.

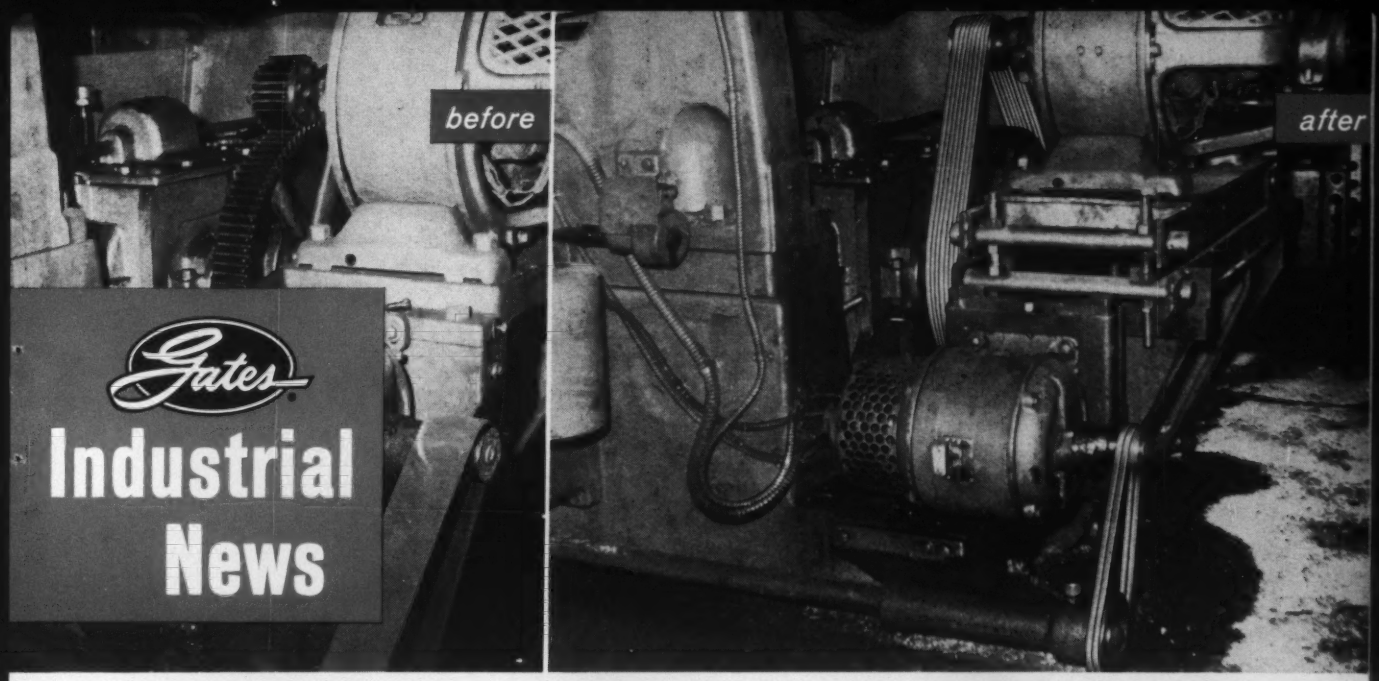
Filtration Merger — RAD, Inc., Cincinnati research and development firm, is merging with Commercial Filters Corp., Melrose, Mass., a subsidiary of the Ogden Corp. Commercial produces a wide range of filters for liquids and gases in the aircraft, missile, chemical and other industries.

Machine Merger—J. C. Whitney Machinery Co. and Addy & Goetz Machinery Co. have merged. Now known as the Addy & Whitney Machinery Co., the company's offices are located at 9051 Brookpark Road, Cleveland.

Vacuum Growth—Special Metals, Inc., is continuing its present line of vacuum induction melted alloys and plans increases in production facilities and research. The new company recently purchased the Metals Div., Kelsey-Hayes Co., for $7.7 million, with plant at New Hartford, N. Y.

Machine Shift—Textile Machine Works has moved the recently purchased packaging machinery operations of J. L. Ferguson Co. from Joliet, Ill., to the main plant at Reading, Pa.

Greater Efficiency — Joy Manufacturing Co. is winding up its two-year program for greater efficiency by consolidating operations at fewer locations. The Coal Machinery Div. at Franklin, Pa., will be expanded to house 200 engineering personnel in a new office building. Manufacturing and engineering activities at Compton, Inc., will be moved from Clarksburg, W. Va., to Franklin. The conveyor dept. at New Philadelphia, O., will also be moved.



Gates

Industrial News

Gear drive caused chatter marks on parts

Gates Super HC High Capacity Drives replace gear and flat belt drives

GATES SUPER HC DRIVE REPLACES GEAR DRIVE IN LIMITED SPACE...

ends costly rejects

Chatter marks on parts produced by a vertical boring mill at Manitoba Bridge and Engineering Works, Ltd., in Winnipeg resulted in costly rejects. The cause of the chatter marks was traced to the gear and pinion on the main drive.

About a year ago, the plant engineer investigated the possibility of replacing the gear drive with a flat belt or conventional V-belt drive. However, to do the job, both types of drive had to be too large to fit into the limited space available.

Advised by a Gates Representative, he then designed a Gates Super HC High Capacity Drive for the boring mill. He found that the high capacity Gates Drive was so compact that it could readily transmit the required power in the space vacated by the gears. Now, with the smooth-running Gates Drive, the mill is turning out clean, even cuts, eliminating chatter marks.

The Gates Fieldman located near you is a drive design expert. To contact him for help in designing a new drive, or for quick delivery of replacement V-belts, call your nearby Gates Distributor.

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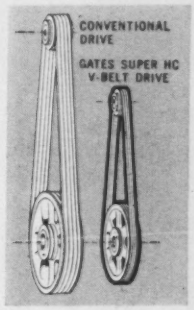
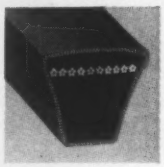
Designing a new Drive?

Gates High Capacity Drive saves space and money ... cuts bearing loads



When you design a new drive or replacement drive, you can save space, weight and money by using a Gates Super HC V-Belt Drive—the first and most advanced high capacity drive. Because of exclusive design features, this new Gates Drive can often transmit the required horsepower in about half the space needed by a conventional V-belt drive—with fewer belts and smaller sheaves.

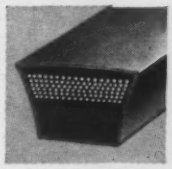


Drive costs are reduced as much as 20%. Drive weight is reduced 20% and more. Guards and machine housings can be smaller, shafts shorter. Reduced weight and overhang on bearings cut bearing loads. Moreover, the Gates Super HC Drive can operate at belt speeds up to 6,000 ft/min without dynamic balancing!

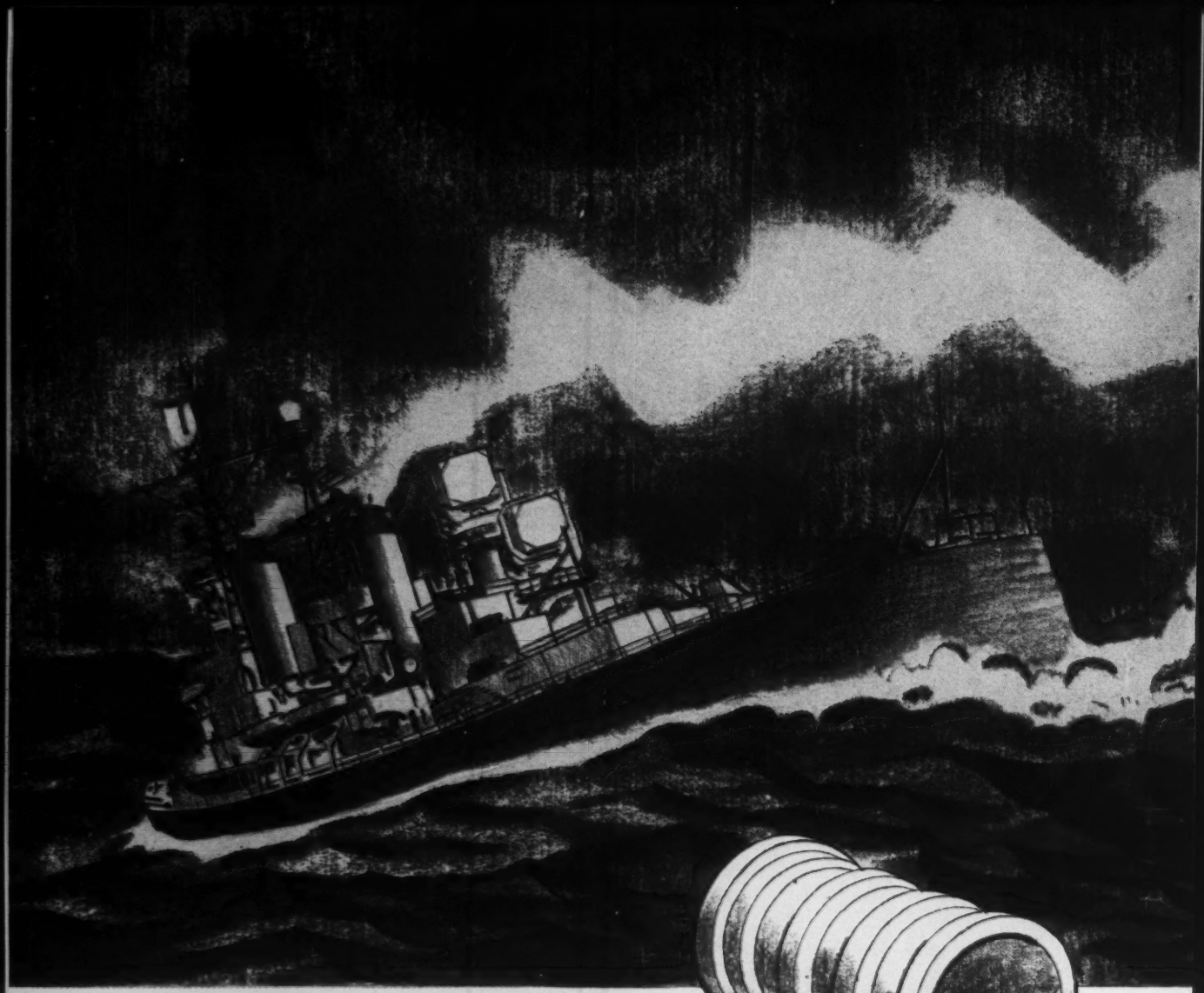
Need replacement V-belts?

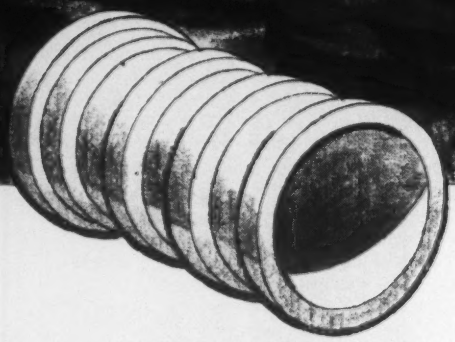
Why Gates Hi-Power V-Belts are industry's No. 1 choice today

The exclusive construction features of Gates Hi-Power V-Belts—Concave Sides, (U.S. Pat. 1813698) Precisely-Engineered Arched Top, Flex-Bonded Tensile Member—make them more dependable than ordinary conventional V-belts, giving you far longer belt life on even the toughest applications.



Moreover, because of Gates high standards of quality control, you get a perfectly matched set of Hi-Power V-Belts every time—every belt pulls its share of the load throughout the long service of the drive, further increasing belt life.

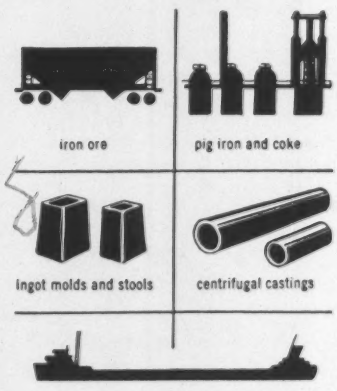




When cylindrical parts are vital it pays to specify Shenango Centrifugal Castings

The stern tube bushing for a fast new Naval vessel illustrated here is one good example of the critical engine parts which are centrifugally cast in Shenango's big foundry and precisely finished in its extensive machine shops. Ferrous or non-ferrous sleeves, bearings, rings or rolls are cleaner, denser and more uniform when they are cast by spinning and they enjoy longer life. And because of Shenango's large capacity and experienced staff your biggest and most complex orders will be handled quickly and exactly to specification. Write for literature.

THIS IS SHENANGO!



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Watch Interest Rates This Fall

Despite recent upturn in business, the money market continues relatively easy. Some short-term rates are declining.

But borrowing needs of business, the government, and the consumer should put upward pressure on rates this fall.

■ So far, interest rates haven't reacted to the improved business conditions.

On the contrary, there have been recent cuts in interest rates on short-term commercial paper. This is the economic term for the short-term borrowings of businesses, usually for seasonal needs.

With summer seasonal factors at work, this turndown in short-term rates isn't surprising. It probably doesn't reflect any permanent trend.

Business Borrowing—When factors shaping the money market for the balance of '61 are studied, the prospect of upward pressure on interest rates is clear. This is especially true of short-term rates.

Consider these facts: Business borrowing to rebuild inventories should be heavy in the next six months. In the spring the decline in durable goods stocks came to a halt. As yet, inventory rebuilding hasn't begun on a large scale. But in August and beyond this should change.

Business will also go more into the money market to finance plant and equipment spending. This, of course, will have a greater impact on long-term interest rates.

More Consumer Plans—Another influence—the consumer—will contribute to the demand for funds from now on. The most recent consumer survey by the University of Michigan indicates the American consumer is "cautiously optimistic" in his outlook.

Among those questioned there were fewer complaints about the difficulty in financing homes. A recent firmer trend in housing starts also points to an increased demand for mortgage credit.

. . . And Government Spending—To business and the consumer add a third influence on money rates—the government. Reports from Washington point to a Federal deficit of $3.9 billion for the fiscal year ended last month. Administration officials blame heavier spending than expected and a drop in government revenues during the recession. They expect another deficit —estimated at $3.7 billion—in the present fiscal year, ending in June, 1962.

All this means the Federal government, as well as state and local governments, will make increasing demands on the money market.

Adding all these facts together, it's clear the money market should tighten in the months ahead. How much is not yet clear. But upward pressure on interest rates should begin soon. Its force will decide when rates will advance and how much.

Don't Discount the Future

■ Is American business initiative slowing down?

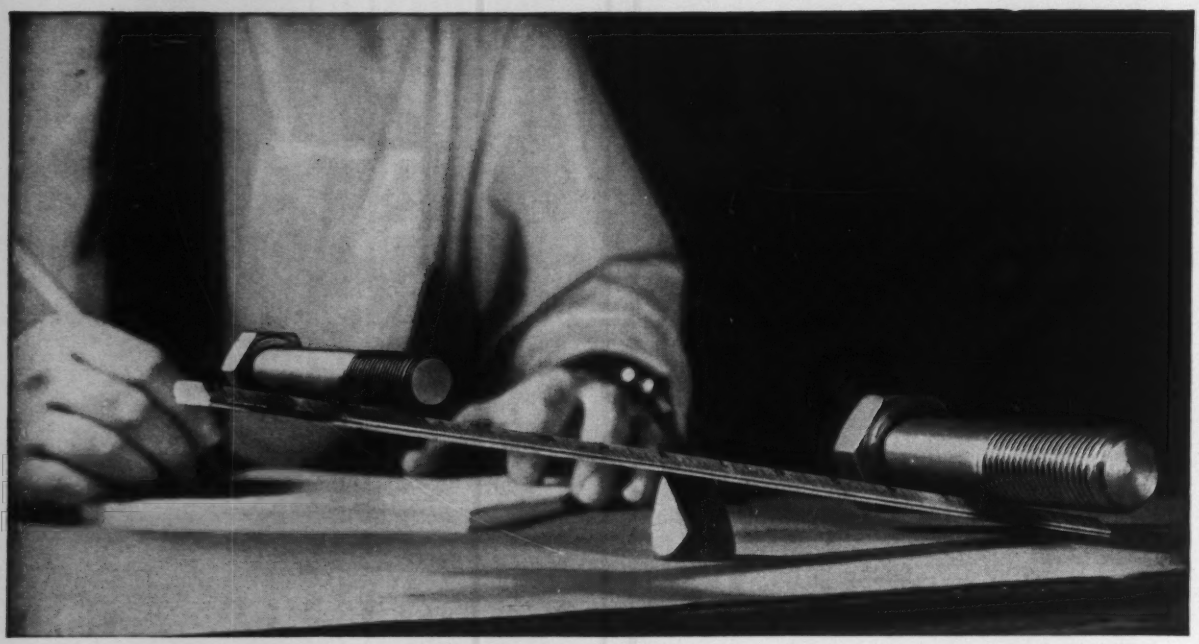
There is evidence that some companies, worried about fixed costs and profit margins, may be short-changing the future.

An equipment maker specializing in new process developments reports little success in selling them to U. S. industry. Four recent manufacturing advances have all been sold and installed overseas before any American companies decided to buy. In some cases, the equipment maker is still trying to sell domestic producers.

Tied to the Past?—There's interest in the new equipment and processes, but it's tepid interest. The equipment maker points out, "A lot of companies are willing to talk about these advances, but they point to the large investment the company has in present producing equipment."

This is a situation difficult to remedy. A recent study by the Machinery and Allied Products Institute on capital spending and internal funds in the postwar period shows what's been happening.

Sources Drying Up—Says MAPI: "Capital formation in the postwar period benefited from a tremendous surge in depreciation and amortization allowances, and in earlier years, from phenomenal retained earnings. The abnormal growth of depreciation is a thing of the past. Retained earnings have receded and for some years have failed to grow at all."



Weighs a 64% cost reduction

Fastener survey by RB&W seeks to deliver maximum holding power per fastener-dollar ... makes possible substantial savings

Since the job of a standard fastener is mainly to hold an assembly together, its *"clamping force"* is what you really want. You can reduce costs by applying this fact and buying fasteners by their *holding power* rather than size.

For example, compare SAE "proof load" and cost ratios of four different hex screws of standard steels.

Grade	SAE Grade 5	SAE Grade 2	SAE Grade 2	SAE Grade 2
Size	¾ x 5"	1 x 5"	1⅛ x 5"	1¼ x 5"
Proof load (lbs)	29,480	16,950	21,350	27,100
Cost Ratio	100%	188%	239%	277%

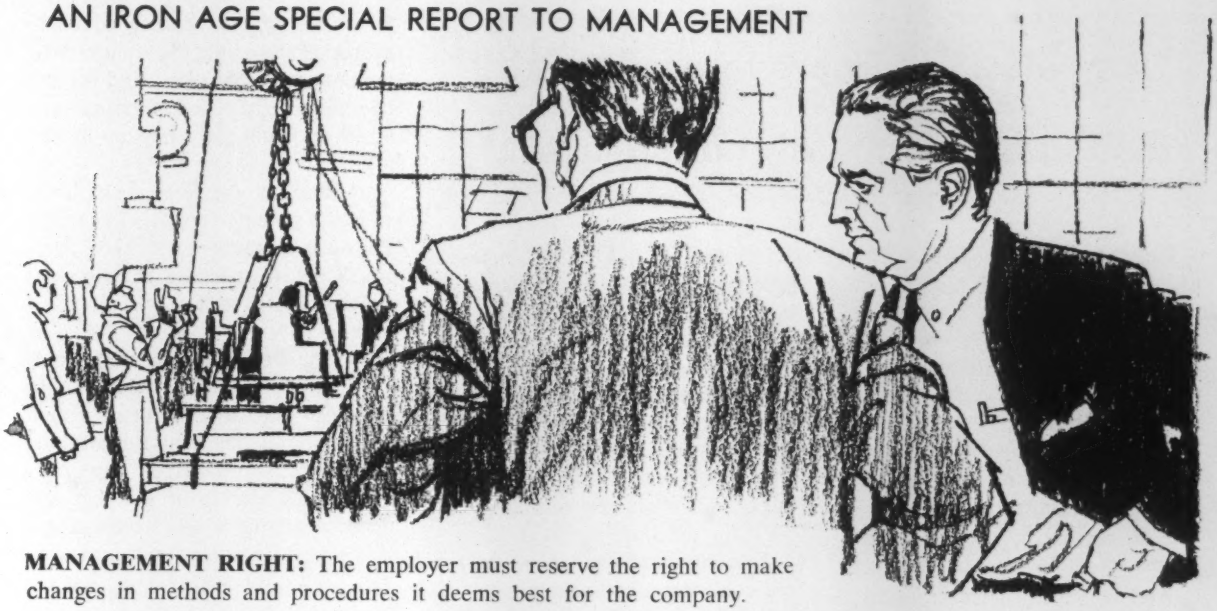
Almost unbelievable. The smallest—the heat treated RB&W High Strength Hex Screw—exceeds all the others in load capacity, can usually be used instead of any of them. But, since it's smallest and weighs less, it also costs you less. 64% less than the 1¼" Grade 2 screw; 58% less than the 1⅛", etc. And because holes can be made smaller, you save on production, too.

Want to get the most from *your* fastener dollars? Let a specialist who best knows the subject of fasteners contribute his knowledge to that of your engineers. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

RB&W

117th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.



MANAGEMENT RIGHT: The employer must reserve the right to make changes in methods and procedures it deems best for the company.

Employer Must "Take Charge" To Gain Productivity Goals

By **R. N. McMurry,** President, The McMurry Co., Chicago, and **J. F. Sullivan,** Labor Relations Consultant.

An employer must make it clear that he intends to run the company if productivity is to be improved.

But an employer runs big risks in tightening discipline. A long and bitter strike could result. A plan is needed.

■ Victory in the battle to win worker allegiance does not guarantee an increase in productivity. It merely flattens some roadblocks in the way of an increase in productivity.

There still will be many individuals who prefer not to work too hard or even efficiently. There still will be danger that pressure for more productivity will build up the prestige and power of the union. This can occur when employees turn to the union as a defense against management's demands for greater output.

The employer, at the outset, must face the fact that any campaign to improve worker productivity will entail a calculated risk. Such a campaign may be totally unproductive. It may create serious employer-union antagonisms. It may even lead to slowdowns and work stoppages. In short, it is a step which demands courage on the part of company executives.

Preparation—Before starting the program certain steps must be taken.

A review of the qualifications of all first-line supervision must be made. Weak or indecisive foremen or supervisors must be replaced. This is especially true where the department has either a militant steward or a chronic trouble maker.

An absolutely clear no-strike clause must be made a part of the union contract.

Clear and detailed instructions and training must be given each employee relative to his job.

A clear understanding must be given to each employee as to what constitutes satisfactory performance, production-wise.

A clear set of shop rules and a statement of the penalties for their violation must be posted.

All details of the union contract must be made familiar to each foreman and supervisor. He must also be familiar with shop rules and have a clear grasp of the extent of his authority in administering the rules. His relations with union representatives must be clearly stated. And he must be convinced that he will be backed up by management.

(continued overleaf)

"Any effort to improve productivity demands courage of management."

Right to Manage—And, lastly, top management must make it clear to everyone that within the framework of the union contract, and its inherent rights to manage the company, it will have the right of final decision in three special areas.

The special areas with right of final decision are: Changes in methods and procedures; placement and use of personnel; reward or discipline of employee performance.

And management must make it known that it will start suit immediately for damages for any breech of the no-strike provision in the contract. In this case, slowdowns and any work stoppage are included.

In short, if individual employee productivity is to be increased, it is first necessary to make this clear to everyone (workers, supervision, union): What each employee is expected to do; what each echelon of supervision may and may not do; what the company rules are; and what is covered by the union contract, and what the company will do if the rules are violated.

In other words, the men who run the company must make a categorical statement to the effect that they propose to run it.

Union Power — If management doesn't accept this responsibility and its risks, certainly no one in the lower echelons can be expected to do so. In the absence of management strength, the union will dominate the operation. And it must be remembered that few unions care whether or not the company makes a profit.

It is not enough for an employer to make statements of his authority. He must be prepared to back them up. This is especially true in supporting the first levels of supervision.

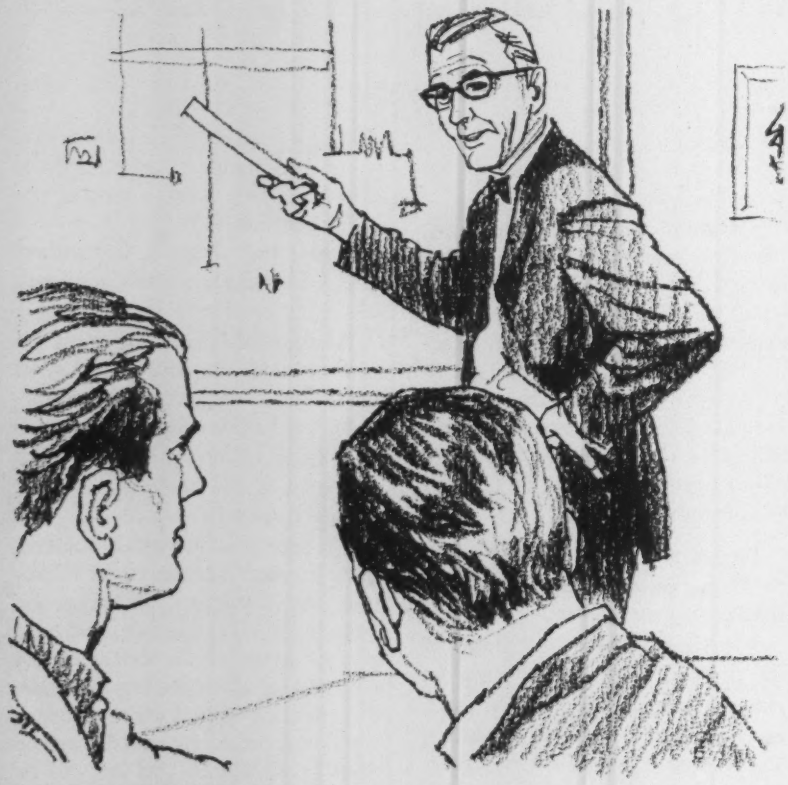
For example, once a single foreman has been made a scapegoat to appease the union, management may as well abandon for all time any hope of enforcing shop discipline. It must also give up any idea of getting a day's work for a day's pay from any of the personnel. It has proved clearly that the union, not management, is running the show.

Management must expect stiff resistance to first efforts to boost individual productivity. Some featherbedding and breaking of rules (often with union support) have come to be regarded by the workers as "rights." They will bitterly resent and resist any discipline that seeks to take away these "rights." But if productivity is to be increased, discipline and pressure must be applied.

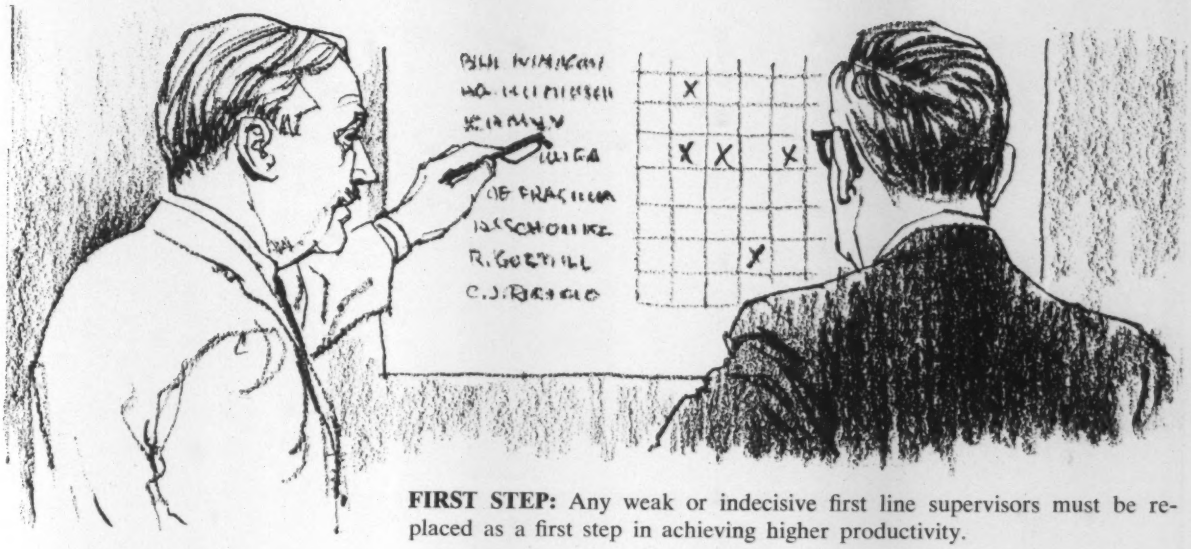
No Cooperation—And little cooperation can be expected from the union. As shown previously, the union conceives its role to be a "merchant of employee discontent." Unless employees are discontented, they will feel little need for the union. And a management program of discipline offers ripe pickings for the union to stir discontent.

In the final analysis, the employer has two choices: He can put his house in order, tighten up his discipline and regain his role as manager. Or, he can temporize the situation he finds.

Position number one will be welcomed neither by many of his workers nor by the union. Many employees will, however, welcome more order and discipline. They will feel more secure under these conditions. But these, unfortunately, will be principally the "face-



JOB KNOWLEDGE: Each employee must be given clear and detailed instructions. He must know what he is to do, and how to do it.



FIRST STEP: Any weak or indecisive first line supervisors must be replaced as a first step in achieving higher productivity.

less ones," those who seek to avoid trouble at any cost.

A consequence of an employer putting his house in order may be a long and bitter strike. If the case should go to arbitration, the company may lose. This would result in more than a financial loss. The company could also have its authority seriously undermined by being forced to reinstate discharged employees, or pay back wages. Victory, or even increased productivity, cannot be assured.

Productivity

"RIGHT TO MANAGE": In this last of this series, the authors show how management can assert its "inherent right to manage the company." This, they say, is the only course that can lead to higher productivity.

Half-way Measures—The second choice, to temporize with the situation, is a very seductive one. This is because it is so easily rationalized.

Management can find many of its own members, university professors, and even a number of consultants who will advise: "Be nice to your employees and they will appreciate it. Let them and the unions know how, in the long run, it is to their own advantage to increase productivity. All they need is a course of training in the principles of economics. If your foremen are weak, all they need is some "leadership training."

Such tactics will certainly antagonize no one. Neither will they, in one case in a thousand, lead to any increase in productivity.

If the employer's competitive position is such that his labor costs are unimportant, he can afford to place his faith in the "human relations" approach. If, on the contrary, his position is critical, he has two choices. He can take over the reins and really manage his company despite the risks entailed. Or he can liquidate his business as rapidly as he can so that there will be at least a little equity left before bankruptcy takes place.

Hard Decision—In the latter event, of course, he will be able to comfort himself by being able to prove by logic that the failure of his business was not really his fault. It was due simply to the fact that his employees were lazy, irresponsible, and did not know what was really good for them.

In summary, the way to increased productivity is not through more and more fringe benefits. It is not communications from management that appeal to the workers' reason.

The key is to win worker allegiance.

Management can win allegiance of the worker through a program of upward and downward communication. A poll of all workers and supervision is needed. This should cover all vital questions of employer-employee relations.

And in this poll workers must name those among them that best understand and can express their needs to management. These selected workers are then the spokesmen for all employees. Management must interview them at length and in depth.

And the employer must "do something" about worker problems as uncovered in the poll and in spokesmen interviews.

Take Charge — The "message" from management is taken back to the employees by their selected spokesmen. The message is essentially that management makes it clear it intends to run the company.

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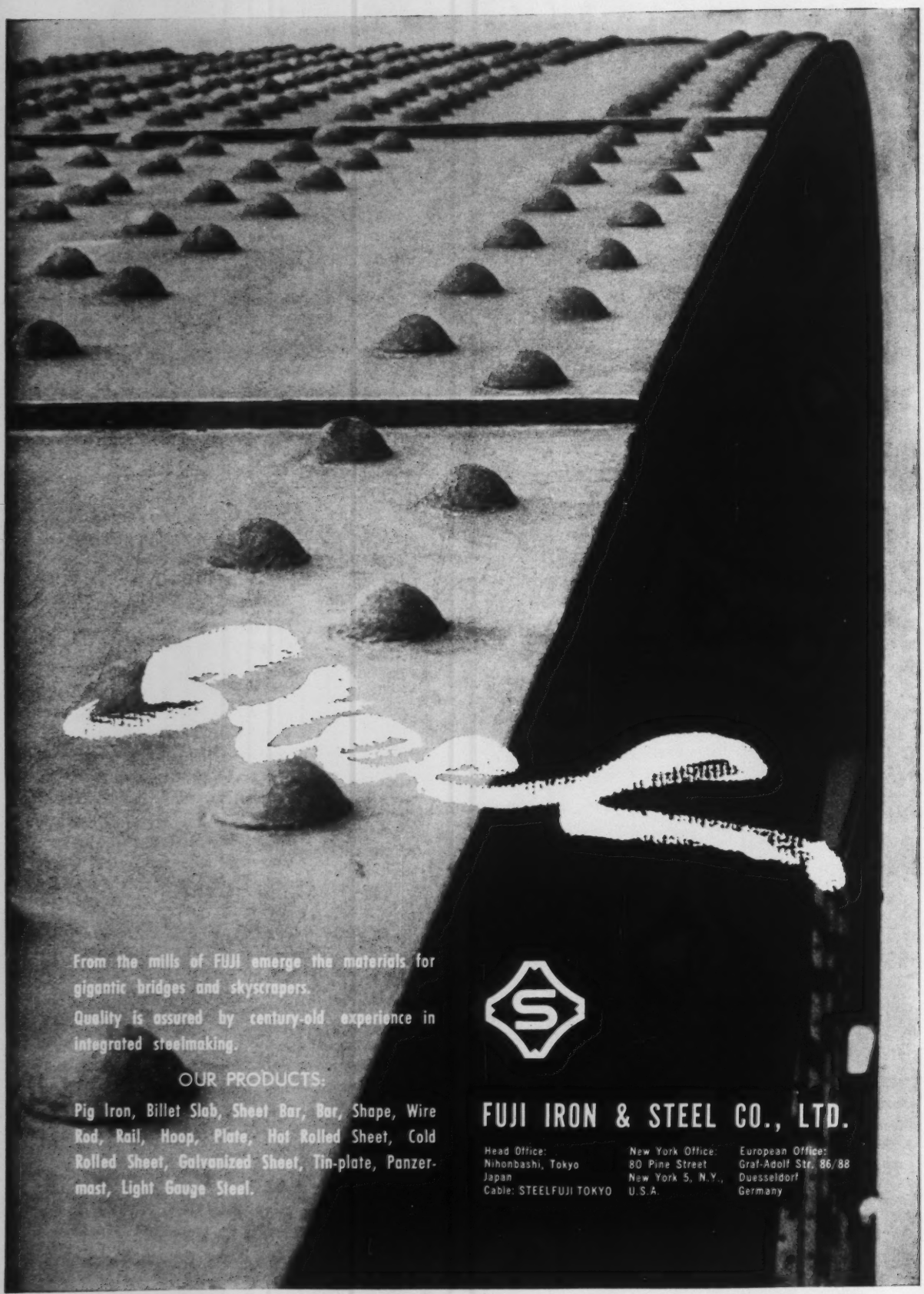
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Sales Spurt Sighted for '62's

Fall Outlook Brighter Than It Was Last Year

A promising outlook for 1962 car sales is in sight, starting in the fall and building.

It's a vast improvement over this time last year when stocks were over 1 million.
By A. E. Fleming

■ The outlook is promising for 1962 car sales this fall, and for steady sales and production into spring.

Odds are much better, in any case, than they were last year.

Then, industry was smothered by a record inventory of over a million cars. Stocks stayed high. What proved to be "unsellable" summer-built 1960 models hung on at dealers well into the winter.

Election Year—Also, auto officials were anxious last year over the Federal election and its effects on business, economy and the consumer.

These factors aren't here this year. There are negotiations between the UAW and automakers. There will be thunderclaps from both sides.

But when new contracts are signed, union and management should be ready to turn out new cars with more vigor than at any time this year.

Inventory Cut — Stocks of new cars by Labor Day will be reduced to a manageable level of some 600,000, compared with 900,000 a year ago.

There will be no headaches this season of disposing of 1961's, no "giveaway" deals that will cut into prospective 1962 sales.

Just the opposite: There are reports that some dealers may be sold out of 1961's before the '62's are ready for public delivery.

This is rare, and it should benefit the 1962 model introduction period. Debuts will be concentrated almost entirely into a two-week span in September.

The Unveiling—All makes except three will be uncloaked between Sept. 12 and 28. Ford Motor Co.'s new-size Fairlane and Meteor series, and Studebaker-Packard's Hawk, will be held back until October or November.

Production of 1961's already is slackening. Over the next few weeks, plants will close for the annual model change. By early August every company will be through with 1961 work.

Production Drop—July production will be around 400,000. August's will drop below 200,000, as 1962 models take over. September's will rebound to 500,000.

Passenger Car Production to Date

	1961	1960
American Motors Corp.		
	198,322	299,875
Chrysler Corp.		
Valiant	67,028	165,880
Plymouth	97,129	154,898
Lancer	24,812	
Dodge	79,157	257,677
De Soto		16,150
Chrysler	50,012	52,201
Imperial	3,872	8,663
Ford Motor Co.		
Ford	450,265	586,099
Falcon	275,739	272,481
Mercury	56,722	94,903
Comet	98,513	78,685
Lincoln	16,166	11,296
General Motors Corp.		
Chevrolet	708,767	1,031,878
Corvair	197,151	153,725
Pontiac	127,736	275,253
Tempest	67,482	
Oldsmobile	131,811	226,823
F-85	35,291	107
Buick	97,953	172,951
Special	47,419	56
Cadillac	89,376	97,405
Studebaker-Packard Corp.		
	29,527	67,249
TOTAL PASSENGER CARS	2,950,250	4,024,255

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How to Keep Pace With Defense

Planner Says Better Management Is a Must Now

With changes coming daily in defense, better management is a must today.

That's the advice of a top planner. He shows how many companies are reorganizing to win defense contracts.
By R. R. Kay

■ Look for sweeping changes in the defense industry. The Space Age technological explosion is at supersonic speed. About the only sure thing is change.

Effects will show up not only in metalworking, but in all companies tied to the military dollar.

The growing need is clear: Better management.

New Trend—Here's the picture of change—and how to keep up with it—from a top planner, J. G. Beerer. He's North American Aviation's vice-president-engineering.

"The truth is that defense companies are becoming custom manufacturers. And the new field of space activity is compounding this trend. Most contracts call for relatively few units, with high technical content for specific applications," Mr. Beerer says.

Contract Factors—Price is still an important factor in winning contracts. But equal weight is now given to technical merit, managerial competence, and past performance in meeting cost estimates and delivery schedules.

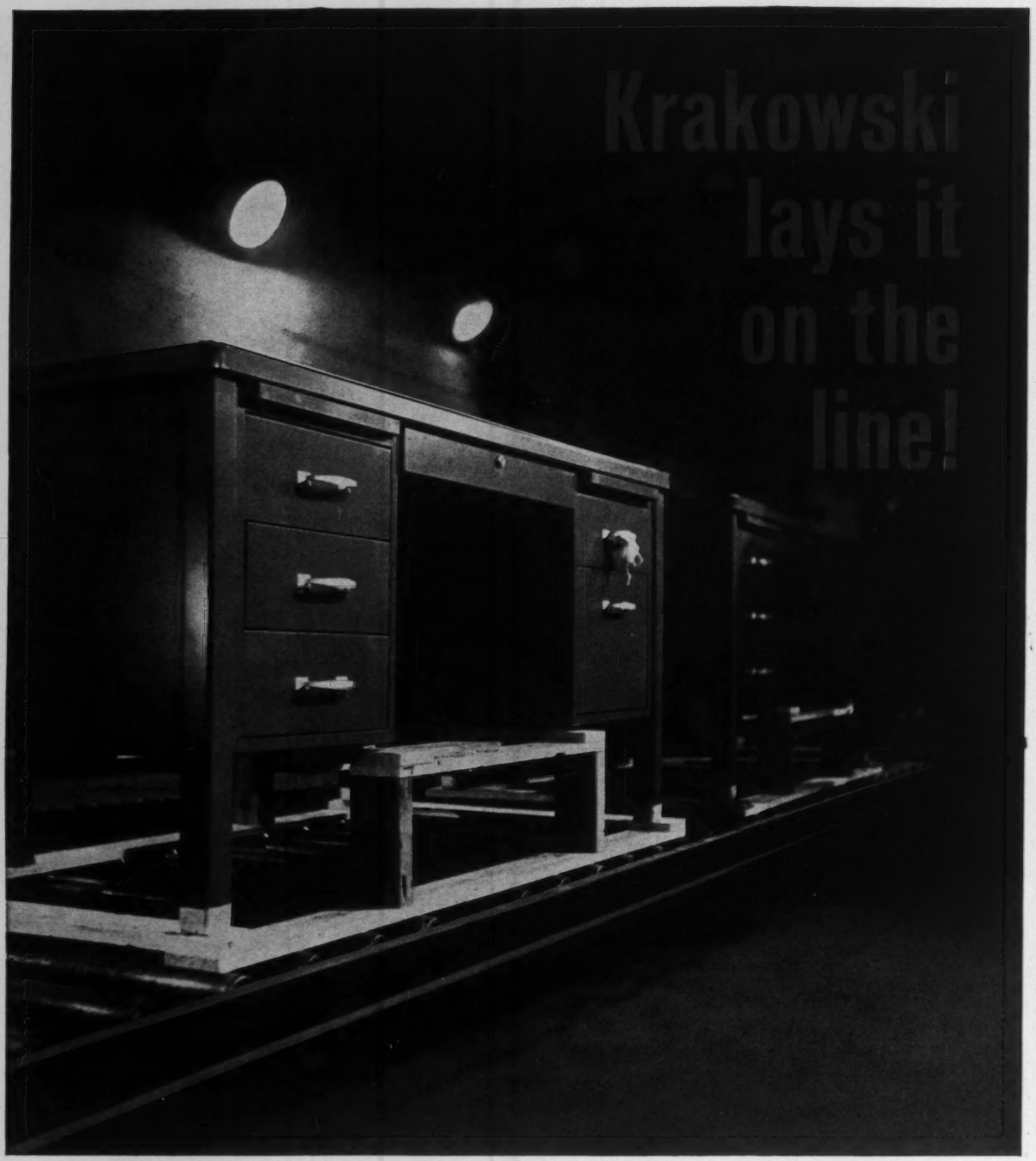
"Steer clear of high costs and schedule overruns. They're bad business," says Mr. Beerer. "They cut your return on sales and hurt your company's future competitive position."

Every day, more and more defense contractors find they must reorganize. They have to streamline operations for better planning and decision-making.

Main Points — Mr. Beerer puts high stress on: 1. Quality control and reliability groups; 2. Setup of systems managers and staffs; 3. Forming divisions, by either product or function; 4. Creation of subsidiaries for special work; and 5. Plant acquisitions via purchase or mergers with other companies.

Rocket Engines Tested At Huge Complex

FREE WORLD'S LARGEST: Rocket engine test stand at Edwards Rocket Site, Calif., is the free world's largest. It is for testing 1.5-million-lb-thrust F-1 rocket engine, developed for NASA by Rocketdyne Div. North American Aviation, Inc. Stand towers 250 ft at $15 million NASA complex.



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Watch Latin American Market

Russian Machinery Builders Are Starting to Compete

The Communist bloc is in an all-out drive to take over the traditional U. S. markets for machinery in Latin America.

So far, this is still the United States' market. But Red inroads are noted.

By R. H. Eshelman

■ In the current touchy area of relations with Latin America, machine tools are one of the critical fields to watch closely.

The Communist bloc is in an all-out drive to take over the traditional U. S. markets for plant machinery. This would give them a real entry into the metalworking plants of the future. It would insure Russian-oriented industry and allow Communist penetration into the vital means of production.

Steps being taken now by the Soviets are somewhat preliminary. They have established perhaps the largest permanent showroom for heavy machine tools in the Western Hemisphere in the friendly climate of Mexico City. Also, they are reported to be making very easy financing arrangements available through this center.

Stumbling Block—Financing is apparently one of the greatest stumbling blocks in the path of local industry. This perhaps accounts for the fact that so much industry has been established by outside companies, many of them American. In virtually all Latin American countries, however, competent observers report there is a real drive on to establish locally owned and operated factories.

And Canadian sources suggest that unless there is more recognition of this fact—and action—U. S. builders are headed for trouble south of the border.

Meanwhile, American exporters of machine tools note that actual penetration of the Soviet machine tool trade effort is hardly noticeable so far. Smaller, general-types of Czech tools, however, do seem to be catching on. They are cheaper than American machines. And, although perhaps less sophisticated, they appear to meet the job-lot needs of smaller plants.

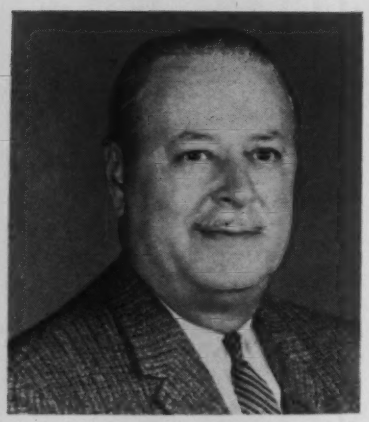
Appliances—Much of the production in these plants is home appliances—refrigerators and radios.

Truck and auto production, mostly established by American companies, is importing less in parts; making more on the spot. Mexico and many South American countries seem to be making a concerted effort in this direction.

Statistics for machine tool imports in Mexico, for instance, are hard to find. Even the U. S. Dept. of Commerce acknowledges it has no firm figures on tools alone—only machinery in general. These show the U. S. still in the lead by a large margin.

ENROUTE SOUTH: Crated machine tools are prepared for shipment from Detroit to a South American customer. These tools came from the F. Joseph Lamb Co. Communist competition for this market is growing.

MEN IN METALWORKING



R. L. Lindner, appointed vice president—general manager, Cleveland Div., Precision Castings Co.

General Magnaplate Corp.—Jack Girard, named general manager, Electro-Plating and Coating Div.

U. S. Engineering Co. — J. T. Gentry, appointed vice president and general manager.

American Chain & Cable Co., Inc.—R. J. Teeple, appointed sales manager, Page Steel and Wire Div.

Sperry Rand Corp.—J. C. Nivus, named purchasing supervisor, and J. A. Wotring, appointed general service manager, aero hydraulics, Vickers, Inc. Div.

Leeds & Northrup Co. — E. F. Rogge, named director, manufacturing; J. Frederick Schock, named local manager, North Wales: W. M. Feeley, named manager, plant engineering and services div.

Bliss & Laughlin, Inc.—Robert Richmond, appointed manager, special products engineering.

Curtiss - Wright Corp. — J. J. Varga, named manager, manufacturing engineering.

Crucible Steel Co. of America—W. R. Mogg, appointed assistant director, metallurgy—technical services.

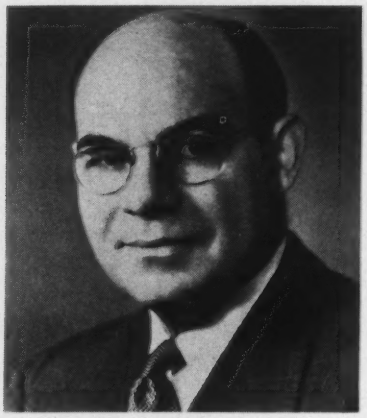
Duff-Norton Co.—W. A. Ellis, appointed hoist products engineer, Coffing Hoist Div.

General Electric Co. — J. T. Castles, appointed general manager, chemical materials dept.

General Dynamics/Electronics—J. P. Vang, appointed product manager, ground support equipment, Marketing Div.

Harbison - Walker Refractories Co.—C. R. Hauth, appointed assistant manager, technical sales.

Daystrom, Inc. — E. G. Grant, named director, new product planning, Military Electronics Div.



B. H. Regenburg, elected president and general manager, Belle City Malleable Iron Co. and the Racine Steel Castings Co.

McLouth Steel Corp. — Emory Miller, appointed assistant plant manager, Gibraltar, Mich. plant; Dan Columbus, appointed general superintendent; Frank Koss, named assistant general superintendent.

Norton Co.—J. C. Ewer, named manager, product and market planning, Abrasive Div.; J. C. Barton, appointed Chicago sales engineer, Machine Tool Div.

Olin Mathieson Chemical Corp.—J. F. Krepley, appointed director—extrusion operations, Metals Div.

Combustion Engineering, Inc.—W. G. Benz, appointed director, quality control.

(Continued on P. 98)

W. R. McCalister, appointed director—industrial engineering, National Tube Div., U. S. Steel Corp.

D. E. Moat, named vice president, government and foreign relations, Leeds & Northrup Co.

J. F. Quereau, named vice president and director, marketing, Leeds & Northrup Co.

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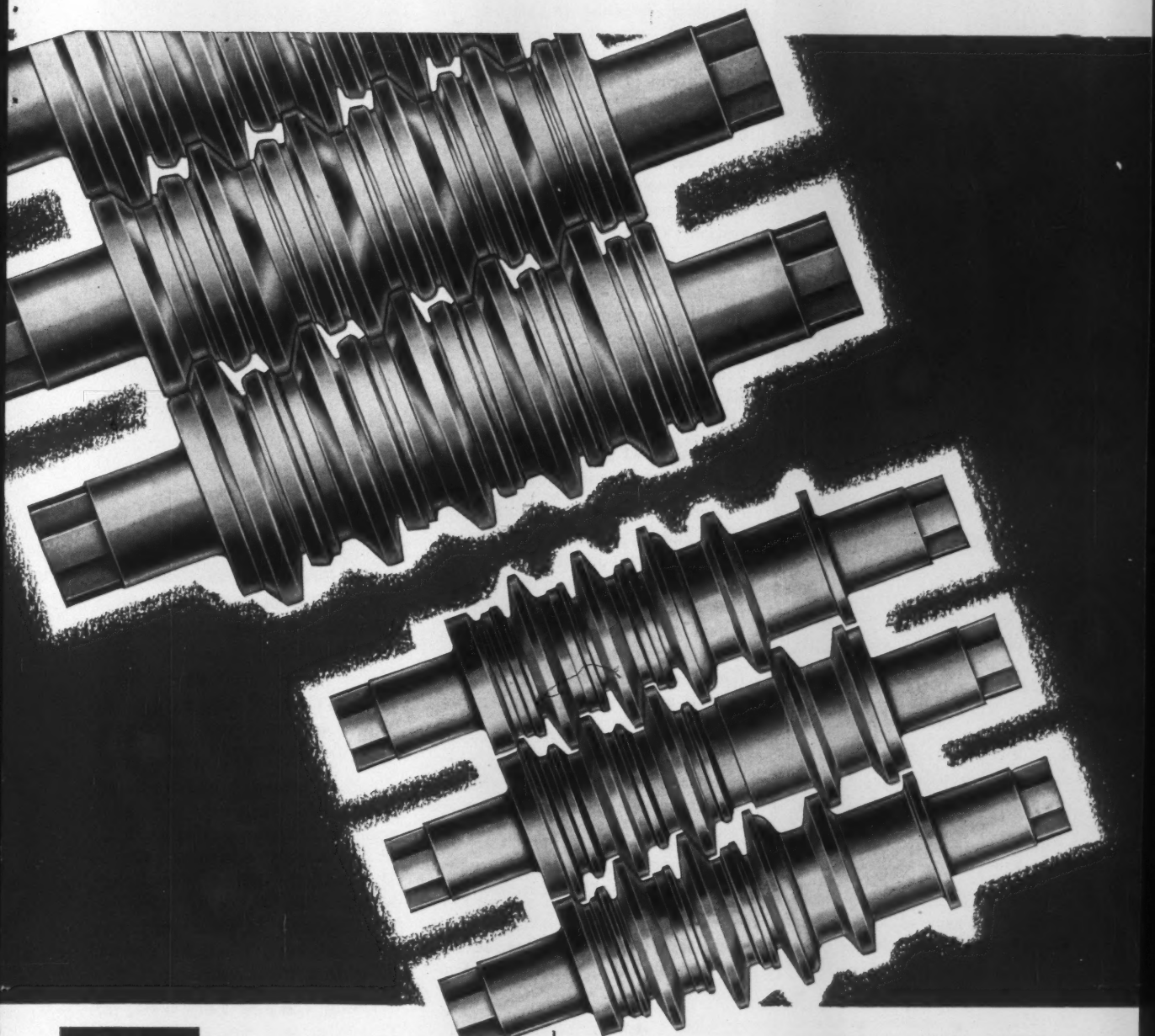

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	x 2¼		x 2½		x 4
3	x 2		x 2¾	4¾	x 2¼
	x 2¼		x 3		x 2½
	x 2½		x 3¼		x 2¾
3¼	x 2		x 3½		x 3
	x 2¼	4¼	x 2		x 3¼
	x 2½		x 2¼		x 3½
	x 2¾		x 2½		x 3¾
3½	x 2		x 2¾		x 4
	x 2¼		x 3		x 4¼
	x 2½		x 3¼	5	x 2½
	x 2¾		x 3½		x 2¾
	x 3		x 3¾		x 3
3¾	x 2	4½	x 2		x 3¼
	x 2¼		x 2¼		x 3½
	x 2½		x 2½		x 3¾
	x 2¾		x 2¾		x 4
	x 3		x 3		x 4¼
	x 3¼		x 3¼		x 4½

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(Continued from P. 96)

Acme Steel Co.—D. L. Bennett, appointed general manager, tool & machine engineering and manufacturing; J. L. Scarry, named asst. general superintendent, primary production, Riverdale Plant; W. T. Fields, named asst. general superintendent, finishing production; T. E. Jaski, named superintendent, Cold Mill Div.; L. G. Ross, named superintendent, Tool & Machinery Mfg. Div.; Ted Conn, named asst. purchasing agent.

Jessop Steel Co.—J. R. Connell, named general manager; G. E. Cassidy, named general manager, operations; G. H. Chubb, named general manager, sales.

Kaiser Steel Corp.—J. D. McDaniel, appointed asst. manager, sheet and strip sales.

Wheeling Steel Corp.—Neal Van Kirk, appointed director, transportation.

Union Steel Corp.—N. B. Haas, appointed midwest sales manager.

Republic Steel Corp. — C. W. Hart, named metallurgical contact representative; J. M. Engel, appointed chief metallurgist, Buffalo plant; L. A. Tryner, appointed assistant superintendent, Mason Dept., Chicago plant; Victor Chacho, named sales engineer, Culvert Div., Detroit and lower Michigan areas.

Westinghouse Electric Corp.—E. G. Lipski, named manager, nonrefrigerated products group, Major Appliance Div. Engineering Dept.

Howell Electric Motors Co.—E. H. Richard, appointed sales manager, magnetics, Ohio Electric Mfg. Co., Div.

Revere Copper & Brass, Inc.—A. L. Molowa, appointed asst. general counsel.

Selas Corp. of America—C. R. Wilt, Jr., appointed asst. chief engineer.

Torrington Manufacturing Co.—K. E. O'Shaughnessy, appointed sales manager, Air-Moving Divisions.

G. L. Roark, appointed general manager, sales, Allegheny Ludlum Steel Corp.

R. K. Powell, elected secretary-treasurer and a director, Fairmont Aluminum Co.

Radio Corp. of America—A. K. Weber, appointed staff vice president, manufacturing.

Allis - Chalmers Manufacturing Co.—H. M. Brundage, appointed manager, Chattanooga district; T. L. Dineen, appointed manager, Cleveland district; Andrew Wassell, appointed manager, utility sales; W. W. Chalmers, appointed manager, industrial sales, Charlotte district. All of Industries Group.

Union Carbide Corp. — R. K. Turner, elected vice president; W. B. Humes, appointed president, Union Carbide Plastics Co.

Brookfield Wire Co., Inc.—H. J. Atkinson, named general sales manager; Hermon Masuzzo, appointed sales representative, New England.

Hughes Aircraft Co.—R. W. Curry, named marketing manager, Vacuum Tube Products Div.

Consolidated Systems Corp. — W. J. Ulrich, appointed engineering representative.

Consolidated Electrodynamics Corp.—W. C. Iversen, appointed manager, manufacturing engineering, Data Recorders Div.; D. E. Sailer, appointed manager, manufacturing engineering, Transducer Div.

General Motors Corp. — J. H. Dew, named superintendent, production; H. R. Coad, named divisional superintendent, production, Pressed Metal Div., Chevrolet-Flint Manufacturing.

Thiokol Chemical Corp.—S. M. Smolensky, appointed general manager, National Electronics Div.

H. K. Porter Co., Inc.—E. R. Crandall, appointed manager, mullite operations.

Fab Tool & Manufacturing Corp. —A. F. Fabiano, named vice president, operations, Clifton, N. J., and King of Prussia, Pa., plants; F. A. Caliri, named asst. to the vice president, operations.

Electric Autolite Co.—R. D. Kelly, appointed manager, national account sales.

Eutectic Welding Alloys Corp.— J. W. Reuter, named division manager, western states.

Electro Refractories & Abrasives Corp.—W. J. Eames, named superintendent, Grinding Wheel Div.

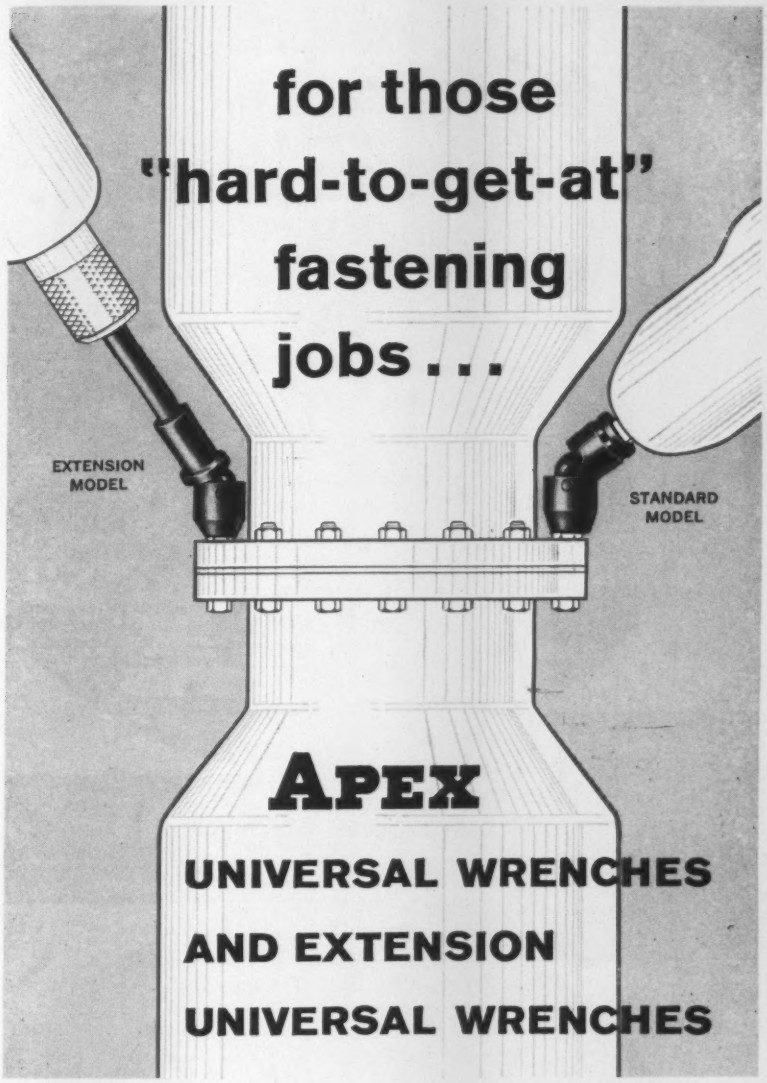
C. A. Roberts Co. — S. M. Roberts, Jr., elected vice president and general manager, Chicago district.

Motec Industries, Inc.—J. S. Guthrie, named vice president.

OBITUARIES

R. J. Sutton, 47, secretary-treasurer, Atkins Saw Div., Borg-Warner Corp.

Glenn Minear, 43, general traffic manager, Maytag Co.



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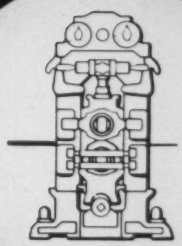

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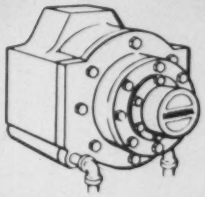

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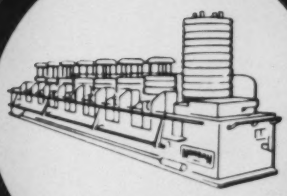

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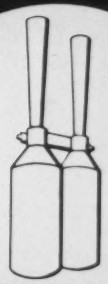

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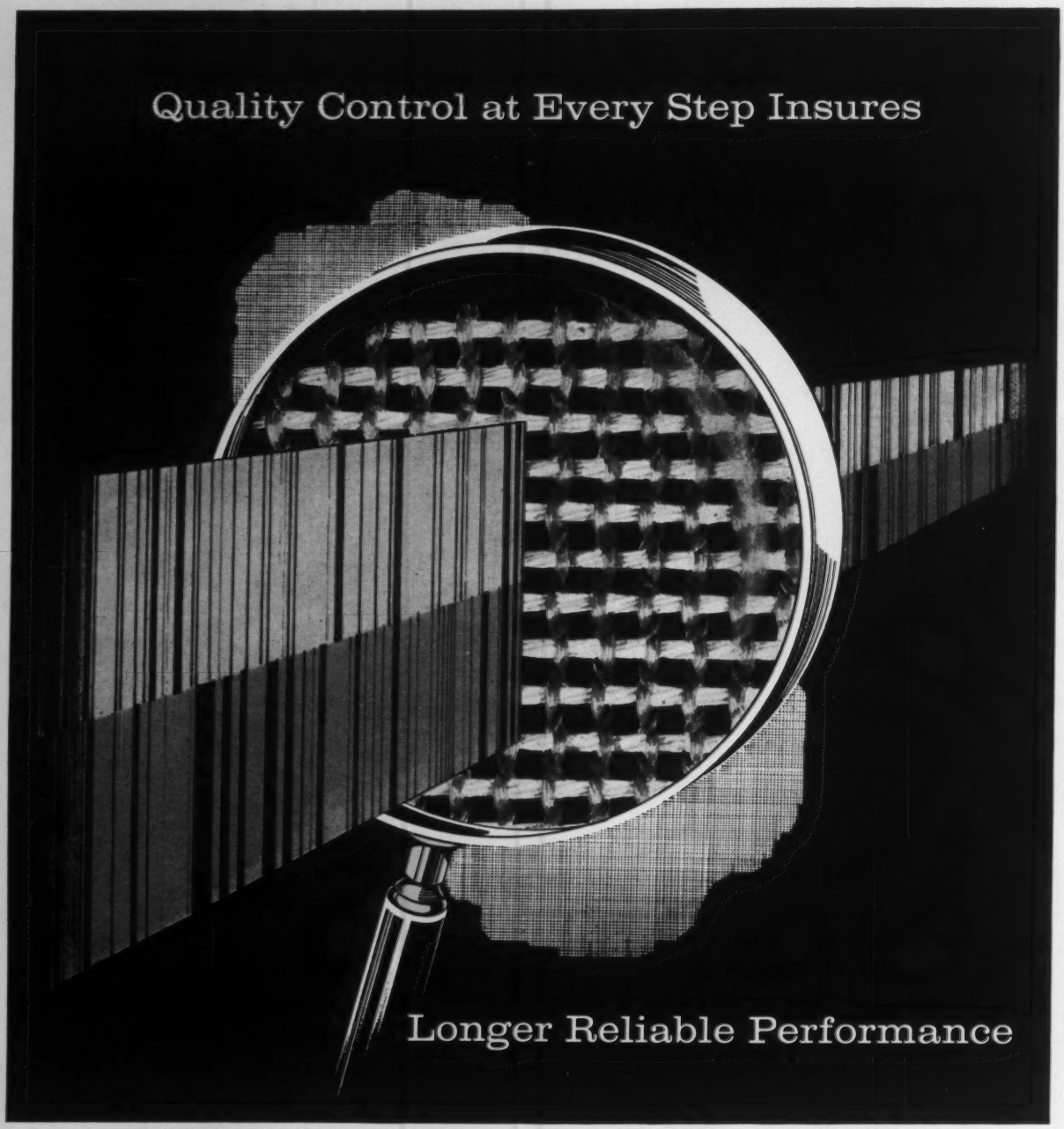

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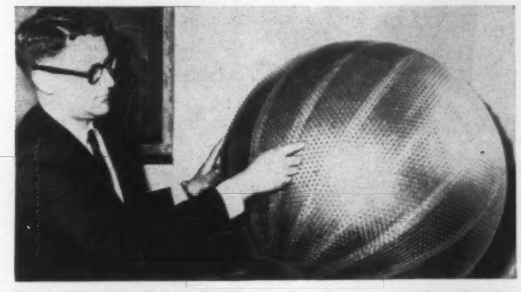
Pares Satellite's Weight

Lighter satellites will be possible with a new combination of aluminum and plastic, says Aluminum Co. of America. Satellite weight is reduced one-third through the use of a chemically-milled foil. Specially produced for inflatable communications satellites, the foil is laminated with plastic to form the skin of giant space balloons.



SPACE BALLOONS: Aluminum and plastic.

Solar-Power Systems Grow

A 4,000-w solar power system for satellites will be studied by Westinghouse Electric Corp under a $50,000 Air Force contract. Aim is to convert energy from the sun into electrical power by means of solar cells. The system is intended to run electronic equipment for periods from one to five years.

Space Trains Studied

One of the newest approaches to long duration space flights is a multi-unit train. It would have a command post up front, a propulsion unit in the center, and a detachable living area or lab cars bringing up the rear. This unitized approach would allow greater flexibility. Some units could return to earth separately. One lab is looking at inflatables and telescoping rigid structures in simulated conditions.

NASA May Lose Control

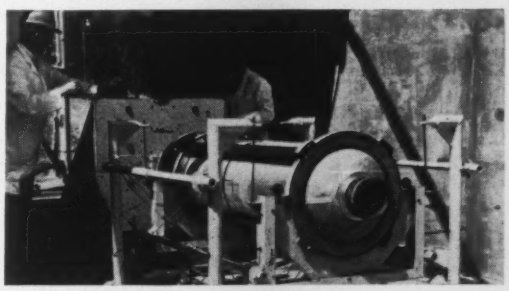
The National Space Council is backing private ownership of communications satellites. In a report to President Kennedy, the council recommended that private companies jointly own the systems under government regulation. The government would control launchings and regulate rates charged the public. Acceptance of this policy would be a victory for private companies and defeat for such agencies as NASA, which sought Government ownership and control.

Engine Hits High Gear

Electric space engines, which may one day send rockets to other planets, will be orbited by NASA next year. The space agency says four earth satellites will be sent up in the electric engine program, the first toward the end of 1962. RCA's Electronics Div. has already been given the nod to start work on the model program.

Hikes Payload Weight

Larger payloads are in sight for space vehicles with the use of a new solid-propellant rocket motor. So says Dr. David Altman of United Technology Corp. By ingenious design of both propellant charge and nozzle, the need for heavy insulating materials inside the rocket has been reduced to a minimum. Weight was also pared by using a new rubber-like insulator in very thin layers.



NEW ROCKET: Add thrust, cuts weight.

Malleable Cast Shells

Controlled-atmosphere annealing processes point up a major breakthrough in the production of military ammunition by casting. This long-time goal utilizes malleable iron with a yield strength of 100,000 psi. Low cost and speed of tooling and production are prime advantages.

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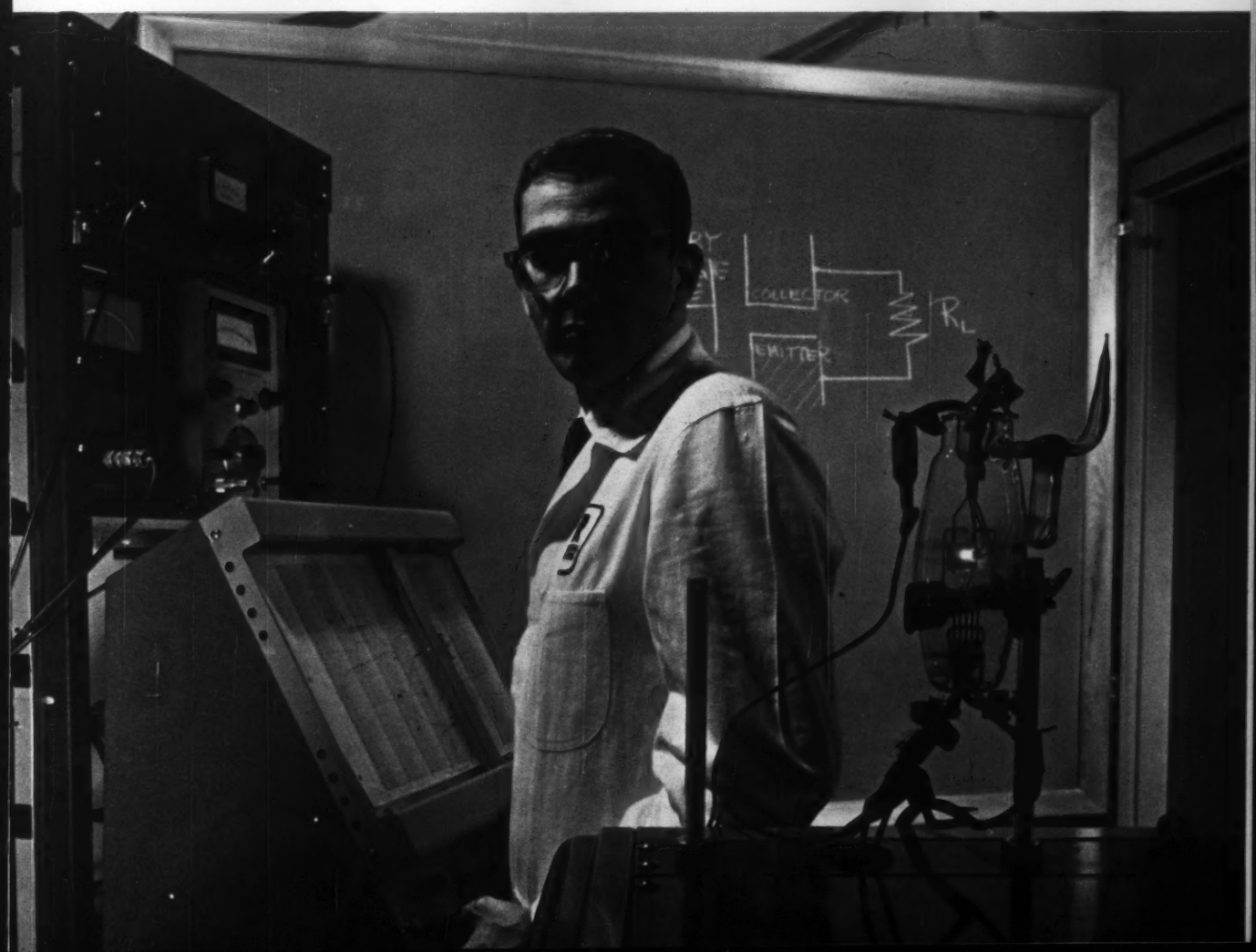
Future Power Systems

■ Refrigerators without moving parts; industrial plants operating from their own self-contained, compact energy converters; space voyages powered by the sun, and unlimited electrical power from fusion of heavy-water atoms—these are some of the dramatic bombs that could explode our conventional technology in years ahead.

According to signs from scores of industrial govern-

By R. H. Eshelman, Machinery Editor



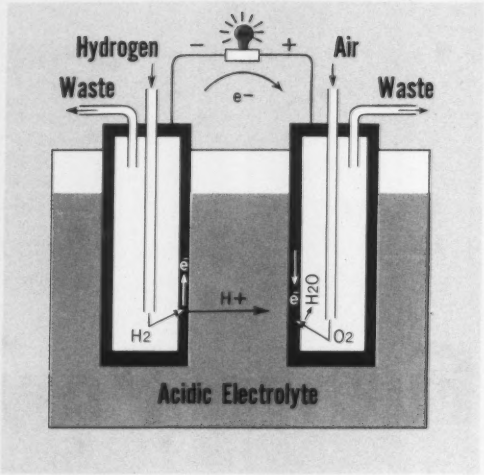
ment laboratories across the nation, many of the basic concepts are already well along.

Why this sudden focus on power—or energy conversion—as some prefer to term it? Already, hundreds of millions of dollars and the efforts of thousands of scientists and research engineers have been poured into this race.

This new power struggle has far more basic significance for the future of industry and this nation than the battle of Sputniks and space. Indeed, they are closely interrelated.

Man has about reached the natural limits of what he can expect to do with present engines and energy systems. Moreover, he's rapidly digging into the stores of fossil fuels available on this planet. Power sources must move faster than the world's expanding population.

In discussing the search for unconventional power sources, J. A. Hutcheson, vice president, engineering, Westinghouse Electric Corp., says, "The impetus for this development effort stems from many things.



Fuel cell could be "dark horse" as source of power for all-electric car. Typical GE hydrogen-oxygen fuel cell consists of two porous electrodes separated by electrolyte.

"In a general way, the continually increasing demand for electric power, and the eventual inability of present energy sources to supply our needs are the dominant factors. However, there are others—the need for specialized power plants to serve in space or in remote land areas."

In space-vehicle programs now on the drawing boards, we are already leaping beyond present methods of propulsion, say astronautical engineers. "We'll need to look at something new in this field," declares Richard Morrison, of the University of Michigan, "if we want to continue to progress.

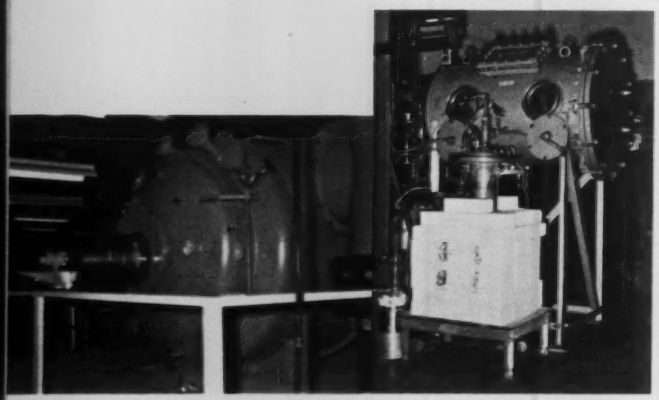
"Thermoelectric and nuclear-electric methods are two under consideration. Then, there is mechanical—squeeze something and get heat and work out of it. We'll be looking at plasmas, also."

Plasmas—hot, electrified gases—comprise much of the matter of the solar system. But they're virtually nonexistent as a natural state here on earth.

Yet, these ionized clouds, often termed the fourth state of matter, may be as vital to the science and technology of the future as combustion has been in the past, according to G. G. Mannella of Battelle Memorial Institute.

"Combustion is reaching the apex of its development. It cannot be counted on as the prime agent of energy release and high temperature in the complex technological processes of the space age," he explains.

(continued overleaf)



Console-arc heater setup is for study of inert-gas plasmas. (Thompson Ramo Woolridge Inc.)

Large, lithium-hydrogen fuel cell operates at 1000°F. Inert gas is for handling and purifying chemicals. (TRW)

Key feature of new Micronized Metals process is the low temperature needed to release hot (1500-2000°C) blasts. Applications include direct reduction of metals.

"Perhaps what combustion has been to the past, plasma will be to the future."

Scientists foresee expanded uses for plasma in both research and industrial technology. For instance, it could provide a high-temperature tool to tackle problems of materials syntheses. One result: Creation of a whole new series of synthetic alloys and high-temperature materials. Another possibility is ore separation by vaporization. Condensing metallic elements singly in a highly purified state is far simpler and quicker than any known extraction process.

Already, one company has developed and is patenting a high-temperature electrothermal reaction of this type to improve metals and alloys.

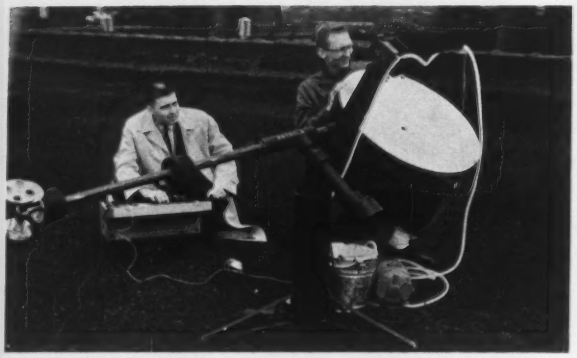
Various types of plasma and electric propulsion methods are under study and development for space missions. One key feature is high payload capacity. It results from either high-velocity exit gases and high specific impulses or low fuel consumption.

In the overall engineering picture, powerplant weight looms as a large factor. Fortunately, several promising developments in small but potent nuclear-power reactors and solar batteries are reaching the practical application stage.

Showing promise is a pinch-plasma engine that's reported to lick the problems of overheating and erosion. This engine converts nitrogen into a plasma. The plasma, in turn, is compressed or pinched by a cylindrical magnetic field until it shoots out of the compression chamber at tremendous velocities.

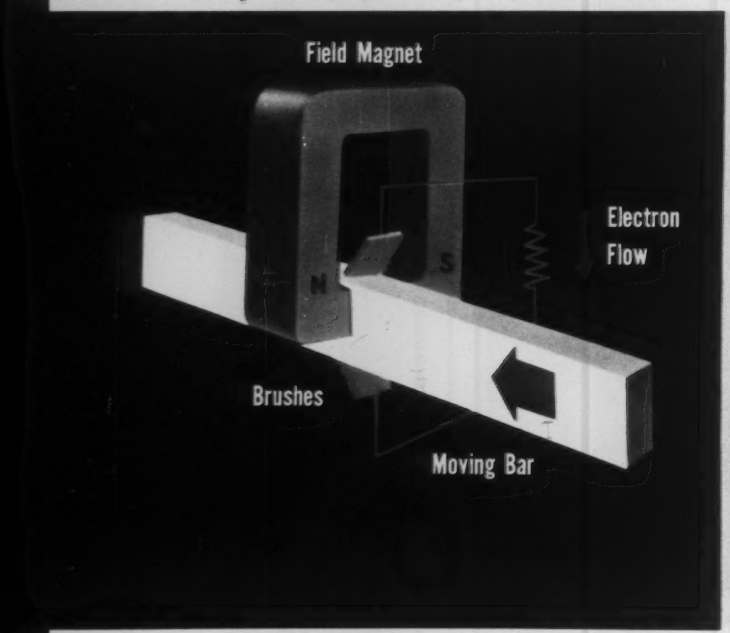
A series of these experimental space engines are under construction and test.

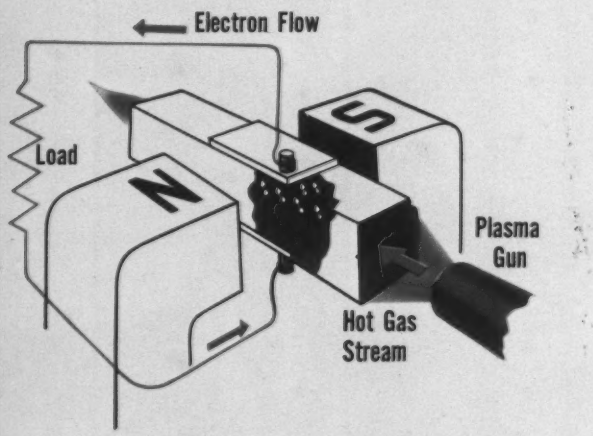
The combination of thermal arcs, plasmas and mag-



Test at TRW of 31½ in. diam. solar concentrator on tracking mount uses a radiometer and pyrheliometer.

Generator (left), in Westinghouse sketch, is based on Michael Faraday's original concept. MHD generator employs same principle; but a conducting gas replaces the moving bar.





netism affords an attractive prospect for power generation. It's known as magnetohydrodynamics (MHD); an electromagnetic field interacts with the field of an electrically conducting fluid such as mercury, or an ionized gas (plasma).

MHD devices are moving closer to commercial operation. Recently, an Eastern research lab working for 12 utility companies unveiled a unit that produces 205 kw—an increase of 20 times our efforts of a few years ago.

"Magnetohydrodynamics is probably the most exciting area of development in power generation today. This idea has stood up well in analytical and experimental work. Studies continue to affirm that MHD power promises high efficiency at reasonable capital costs." So says Philip Sporn, president of American Electric Power Co.

The basic principle of MHD is like that of Michael Faraday's generator invented in 1831. The main difference is the absence of mechanical, moving parts. Faraday's rotating armature is replaced by a hot, high-speed gas which spins at velocities far above those possible for mechanical equipment.

The plasma, moving across the magnetic field, induces an electromotive force or potential difference between two electrodes.

One dramatic possibility for MHD is an electric auto with a greatly simplified power system. It will have no transmission, clutch, differential, ignition or friction brakes.

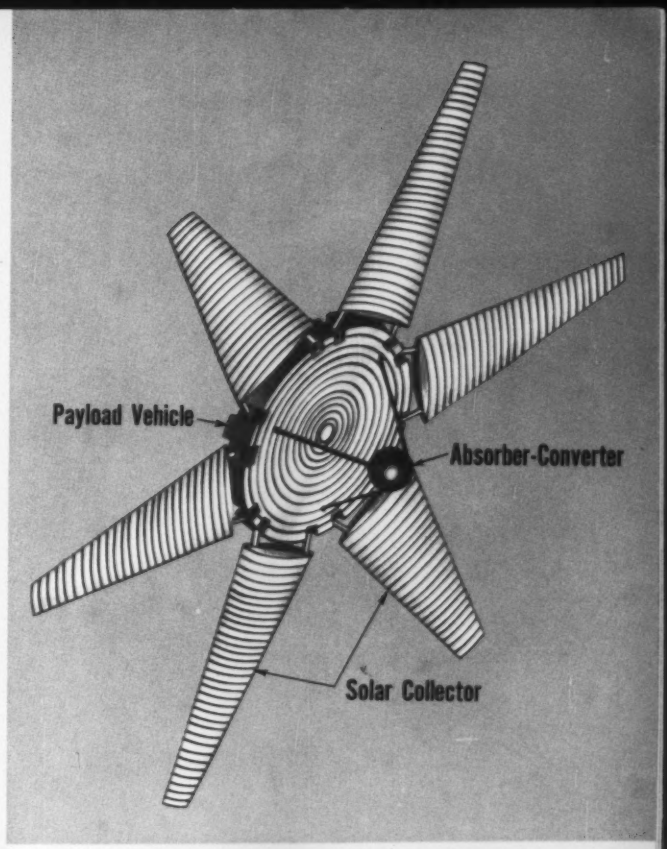
The basic unit would consist of a magnetic piston pushed rapidly back and forth by an exploding mixture of air and gasoline. Electricity generated would drive motors on the four wheels.

According to M. C. Gourdine of Plasmadyne Corp., there are engineering problems, but the new system would be far superior to the reciprocating engine and bulky power train.

Some of the problems with these plasma devices are substantial. "The trouble is," says A. B. Cambel, head of the gas dynamics laboratory at Northwestern University, "that in designing an engineering device, it's necessary to know the properties of the medium used."

Despite considerable research, a lot remains to be learned about plasma properties. High temperatures—in millions of degrees—make measurements difficult and uncertain during split-second reactions.

An understanding of plasma appears to be the key to a number of applications in addition to MHD. Included are plasma welding, cutting and materials-coating equipment, and the harnessing of the hydrogen bomb.

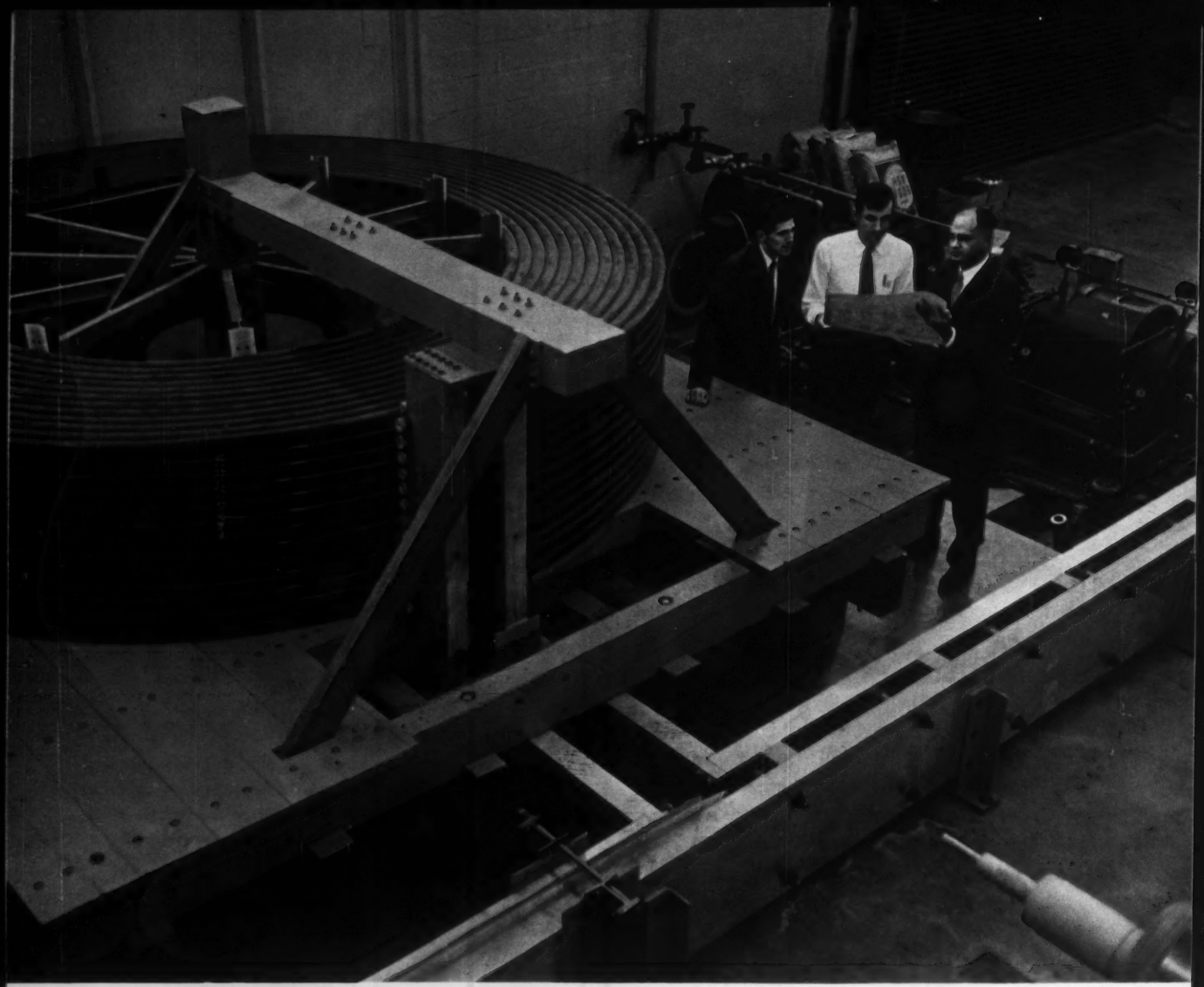


For space vehicles, one GE plan suggests large solar collectors to focus sun's rays onto an absorber which converts energy to electricity.

Thus, there's a tremendous surge of interest and activity focused on this new area of physics. The National Bureau of Standards has taken up the challenge of measurements and basic understanding of plasmas; and radio astronomers are using the best plasma research lab of all—the sun.

Astronautical, electrical, and nuclear engineering groups at the University of Michigan are teaming to create one of the world's most advanced facilities for such frontier research.

Plans for this magneto-fluid dynamics laboratory reveal areas where the new understanding of energy will have its greatest impact: Space-flight phenomena, high-energy storage and transfer (communications tech-



Special generator-coil setup at University of Michigan converts standard high voltage into very short bursts of ultrahigh power for use in hypersonic "hot-shot" wind tunnel.

nology), and thermonuclear energy.

At the heart of the laboratory is a hypersonic "hot-shot" wind tunnel that delivers pulses between one and two million kilowatts. It consists of a unipolar generator—a huge coil, 5 ft thick and 20 ft diam, wound with a cable as thick as a baseball bat.

The device works as follows: The generator takes electrical energy from standard high-voltage power lines and delivers short bursts of ultrahigh current—about 350,000 amps—into the air chamber. The gas expands, ruptures a metal diaphragm, blasts through a tiny nozzle past a test model, and into a vacuum tank.

"How do you get from one form of energy to another in the most direct fashion?" asks Richard Morrison, astronautical professor, University of Michigan. "This is going to be one of the most pertinent questions of the future."

Today's technological revolution is merging many scientific and engineering disciplines. The energy-conversion field blankets a far broader spectrum of interest than any other single area of knowledge. Moreover, the lead time from discovery to utilization is vanishing.

Controlled thermonuclear fusion, as a virtually unlimited source of industrial power, appears to be the ultimate goal. Scientific teams at several centers have achieved some success in early experiments. One example is the Stellarator setup at Princeton's Forrestal

Research Center.

The basic problem in harnessing nuclear fusion is how to contain the nuclei of heavy hydrogen. Fusion requires temperatures of millions of degrees and there's no vessel to contain it.

One approach to this problem is to use "magnetic bottles." Despite some tendencies to leak, thermonuclear reactions have been sustained for periods of about one-thousandth of a second.

One of the new research tools is Toy Top III, a "magnetic mirror." According to recent reports of Richard Post of the University of California, this reflecting device is able to hold a plasma at around 40 million degrees for a short time. In time, Dr. Post's group hopes to boost the temperature to double that, and hold it for five-thousandths of a second.

Thermoelectrics: Many unconventional but practical devices are already in the development stage. One, recently completed for the Navy, by Westinghouse Electric Corp., is a thermoelectric generator that delivers 5 kw. Without any major moving parts, it converts heat into electricity.

This unit is mainly experimental. It's intended for evaluation of power-generating materials and fabrication techniques under a joint Army, Air Force and Navy power program.

According to Navy sponsors, new materials developed in the last three years have tripled the efficiency with which heat can be converted directly into electricity. This rate of progress suggests that a breakthrough to practical application is at hand.

It now appears that no one method can answer all the individual needs of, for example, advanced-type submarines and space vehicles. Thus, all the military services are also vitally interested in thermionic, solar and fuel-call power devices.

Thermionic conversion is another way to efficiently convert heat to electricity. The principle is basically that found in the familiar radio vacuum tube.

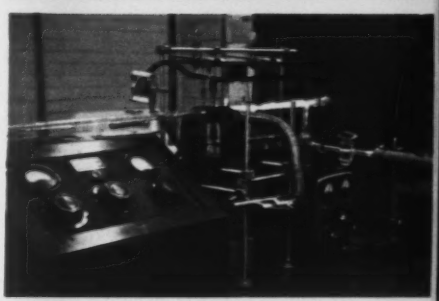
These generators produce electrical power by using electrons emitted from the surface of a certain hot material. Sometimes, cesium vapor is used to boost performance. For military applications, where compactness, light weight, simplicity and high efficiency are important, such devices show real merit.

For the immediate future, use of the thermionic principle in small nuclear reactions looks most promising. A scale model has already been demonstrated by General Electric scientists.

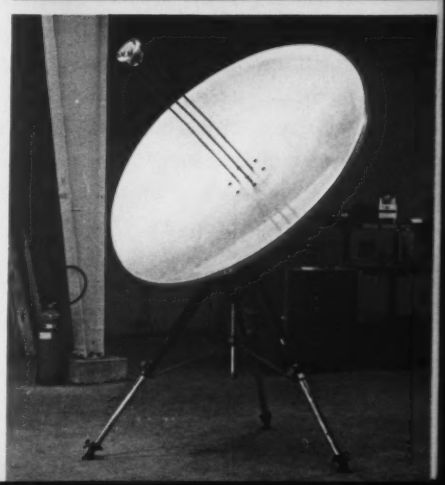
The basic unit of this "watermelon-size reactor" is a plasma diode capsule. This compact, modular, static-type unit could be ready for satellites and other space use within five years, project scientists report.

More advanced thermionic fuel elements could, perhaps within ten years, obsolete present mechanical-fission reactors. According to Robert Pidd, formerly of the University of Michigan, the "plasma thermo-

Supersonic plasma accelerator (TRW) is mounted in a magnet. Accelerator produces Mach No. gain of 1.5.

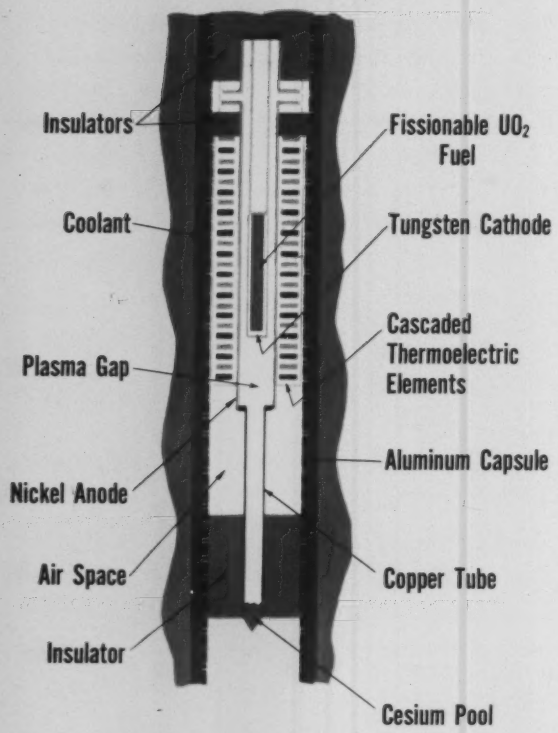


Subsonic plasma accelerator (TRW) uses argon gas. Plasma is generated inside the channel by r.f. power.



TRW's 36-in. solar concentrator of spun aluminum, has thermionic converter at focal point.

Fission Fired Combination Thermionic Thermoelectric Direct Converter



Heat from nuclear fuel triggers electrical power from both thermionic and thermoelectric devices in Westinghouse tandem unit.

couple" could also replace boilers, turbines, gas condensers and dynamos. And cost of nuclear power would be cut drastically.

The Atomic Energy Commission has contracted for about a dozen systems for nuclear auxiliary power (SNAP). Capable of 5-30 watts output, these portable units are to furnish power for sea buoys, automatic weather stations, and other Navy uses. They will also supply electrical power to earth satellites—perhaps for communications or even world-wide TV transmission.

Conversion of chemical to electric energy is also a good prospect. Lt. Gen. A. G. Trudeau, chief of research and development for the Army, foresees great possibilities.

"Our research laboratories must lead us in the study of new potential sources of power; such as fuel cells, MHD generators, solar cells and nuclear reactors. Of these, the fuel cell now seems the most promising for the 1970's."

L. R. Hafstad, director of General Motors research, agrees. He feels it's "the only really promising dark horse" as a source of power for an all-electric car.

Another way to convert thermal energy into electrical energy is a regenerative fuel-cell system, developed by Delco-Remy Div., General Motors. J. J. Landers, who directs the project, sees the possibility of utilizing solar heat and nuclear heat as well as standard chemical combustion.

A different approach is one recently announced by the Geological Survey. The fact that ocean-bottom sediments and overlying sea water act as gigantic fuel cells led Frederick Sisler, research biochemist, to develop a small lab prototype. It produces electrical energy directly from decomposition of organic matter by photosynthesis and biological processes.

On a commercial scale, this concept could mean the conversion of sewerage and industrial wastes into electricity.

Applications include chemicals, paper and canning industries, extraction of minerals from the oceans, and long space trips.

Until World War II, often as much as fifty years elapsed from the date of a basic scientific discovery until something was done with it. Today, industry and government have merged their new research teams.

With all the intensive research applied to energy conversion, startling changes surely lie ahead for the metalworking industry.

Metalworking's Technological Explosion

This article on Future Power Systems is the second in The IRON AGE's new series on "Metalworking's Technological Explosion." The next subject, steelmaking, will be covered in the Sept. 14 issue.

Reprints of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa. Ask for Reprint No. 177.

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IN SOAKING PIT CONSTRUCTION

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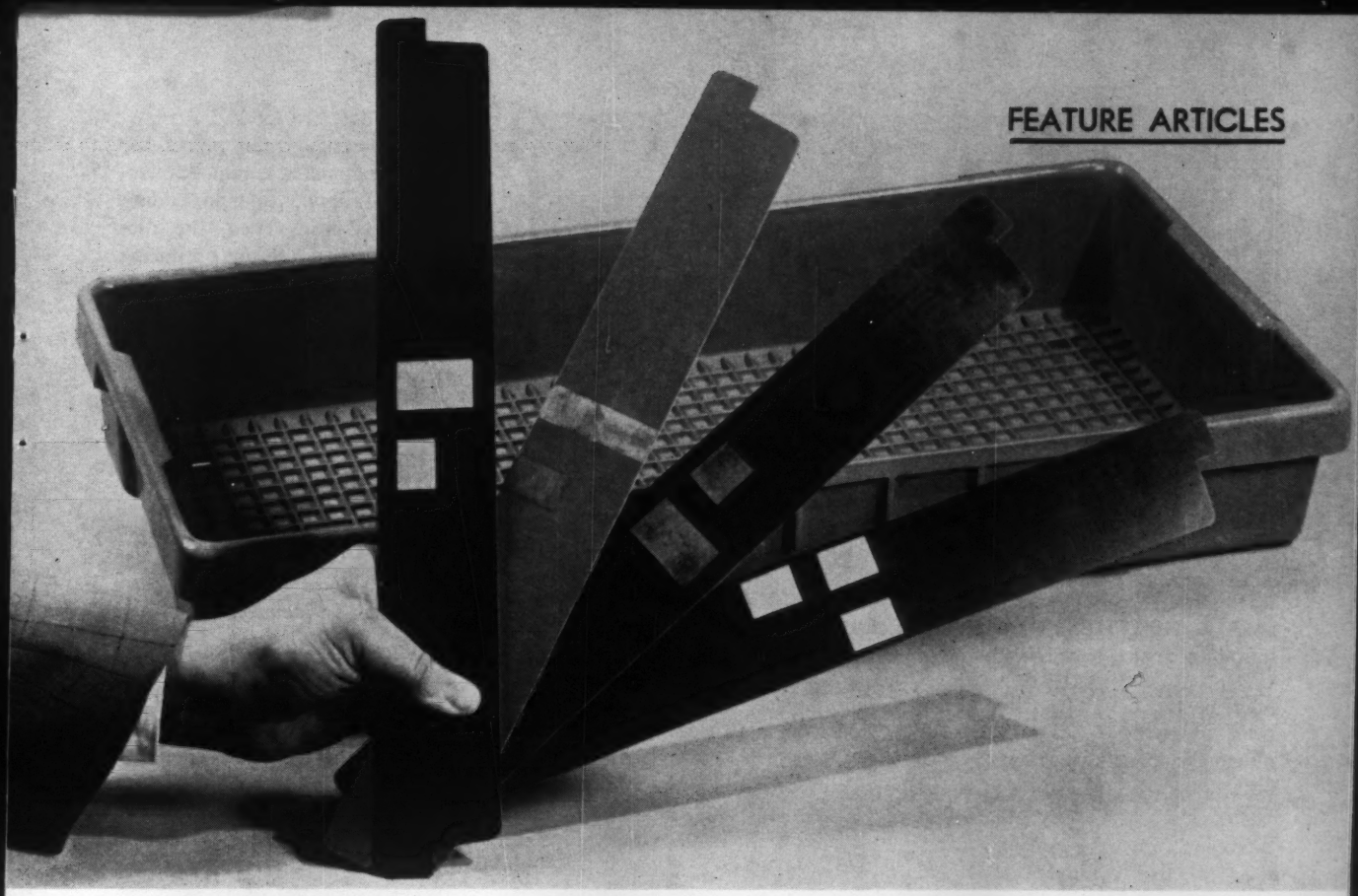


COLOR CODE: Dyed different colors, visual-code readers are attached to the sides of mail-bearing trays.

How to Code Look-Alike Parts

Small Laminate and Vulcanized-Fiber Parts Gain Identity Codes

By **Fritz Hutta**—Mgr., Planning and Engineering, Taylor Fibre Co., Norristown, Pa.

Parts which look alike, but aren't identical, create stockroom and assembly-line snags.

With no cost buildup, it's easy to code vulcanized-fiber and laminated-plastic shapes.

■ Look-alike parts that aren't identical cause production headaches. They're easy to mix up. Supplier identification is often impossible. As a result, costly mistakes occur. In addition, the fear of mistakes slows down assembly work.

Instant identification is highly desirable. Nevertheless, the cost of pinpointing such identification can mushroom. Sometimes it spirals so high that a manufacturer drops this hot potato in the user's lap.

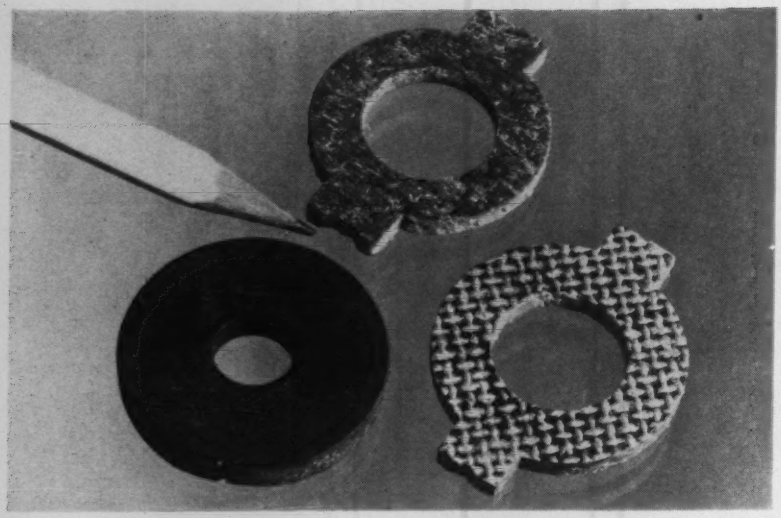
Easy Way Out—With laminated-plastic and vulcanized-fiber parts, it's easy to solve these identity problems. And the solution requires little or no extra cost.

There are six reasons why look-alike parts are given an identity code. In some instances, only one reason is applicable. In other cases, several distinct advantages may be realized.

The six reasons cited by most purchasers include: Simplified stocking, easier assembly, reduced costs, fast supplier identification, end-use coding and improved maintenance.

Of course, there may be other special reasons. A user may wish to identify the part with his company name or part number. In some cases, users find it worthwhile to "color code" vital components.

Three Methods—While a number of variations are possible, there are only three basic ways to simplify the identification of laminate or



SMALL NOTCHES: Serrated or notched edges pinpoint suppliers. This simplifies stockroom problems. Stamped or printed codes can also be used.

fiber parts. You can color them, print or stamp data on them, or notch the parts with keyed symbols.

Color codes are widely used. Sometimes a laminate or vulcanized-fiber part is colored throughout. However, individual plies — either facings or liners within the material —can also be colored.

Normally, color is added at the beginning of the manufacturing process. Depending on the material and the color selected, color coding may be effected at no extra cost.

Companies that make gears, motor-terminal plates, condenser-can tops and a variety of other parts often adapt color - facing codes. Black, red, green or chocolate options are offered. These four colors yield a total of ten possible color combinations when they're added to the materials' natural colors.

Substitute and Save—Quite often, a user requests sanding solely as a means of identification. If color facings are substituted, the cost of these parts tumbles.

A major electrical manufacturer uses small laminated-plastic switch bars with square cross sections. This purchaser specifies that single plies of black material be inserted inside the natural-color sheets.

After the sheets are shaped into square bars, the black liners provide a clear and instant identification from both side and end views.

Color liners permit a large number of look-alike parts to be differentiated. Both the spacing and the thickness of the liners can be varied. This means each colored liner can be tailored to size.

Take Your Choice—There are many ways in which fabricated parts can be marked with paints, dyes, lacquers or inks. Color and printed data sometimes combine for double-protective coding.

Let's study an example of the use of color alone. A case in point centers on an auto-parts supplier who stocks electrical bushings in three lengths. These lengths vary by only ⅛ in. To prevent errors in storeroom handling and assembly, this company has a lateral color strip put on one side of each part.

A red strip identifies the longest parts. Orange codes the shortest parts and yellow pins down all intermediate lengths.

Dual Codes—Now, we'll move along to a double-protective code. Color and printed data team up to code terminal plates for fractional-horsepower motors. Each terminal plate contains eight pairs of slots.

All slot pairs are coded by small dots in different basic colors and by numbers. The numbers are stamped into the material at the same spot where the dots are located.

An automatic printer marks the dots on the punched laminated-plastic panels. It applies all color coding in a single pass. Then, the die-stamped numbers are put on during the forming cycle. The regular punching-die set handles this numbering work.

Even if the color dots wear off or fade away, the imprinted numbers remain. The cost of this double identification is almost negligible.

It's also possible to shape parts then add the color code. Coloring takes place by simply dropping the parts into a bucket of dye. Or else you can paint or lacquer the parts to give them an identity.

Stamped Identity—Using a die to stamp numbers or other data serves as a low-cost means of coding stamped or punched parts. Provisions for stamping can be made in tooling stages. Thus, no extra operations are needed to mark the parts. And the extra tooling charge is small.

When laminate parts are machined, silk-screen or rubber-stamp printing is often employed. On long runs, mechanization keeps costs down.

Silicon- and epoxy - laminated plastics cause printing problems. Often they must be sanded before printing. Sanding can add as much as 40 pct to the cost of these parts.

To solve this printing problem, Taylor Fibre Co. recently introduced a new silicon- and epoxy-laminate finish. It provides a slightly dulled surface. This new finish holds ink without pre-sanding.

Notching or serrating the edge of a stamped part also serves as a simple identity code. A provision for notching can be made in the stamping die. One company uses this method to differentiate between several suppliers of asbestos-laminate washers for water pumps.

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Ask for Reprint **No. 195**

Electron Furnace Anneals Strip

Vacuum-Chambered Unit Boasts Highest Known Output

A high production-sized electron beam annealing furnace makes short work of reactive metal strip.

Operating under high vacuum, the furnace can process strip faster than the rolling units can feed it.

■ Electron beam furnaces are growing in both size and scope. As a matter of fact, Temescal Metallurgical Corp., Berkeley, Calif., has one in the offing that meets the highest of production demands.

The continuous annealing furnace uses electron beam heating to process sheet metal strip. Annealing is done under high vacuum.

Job Hunting—Electron-beam annealing will find a broad range of uses for reactive metals. These include tantalum, columbium, titanium and zirconium as well as other metals that require high vacuums in processing or purified environments during annealing.

The company says the unit will find immediate use for metals for atomic energy power plants. Also, the furnace will fill a need for the newer rockets and missiles.

In short, a coil of strip stock unwinds and feeds into the furnace chamber, passes over the electron beam gun, then exits and rewinds at the other end. Inside the chamber, heating and other processing steps take place at an unusually fast rate.

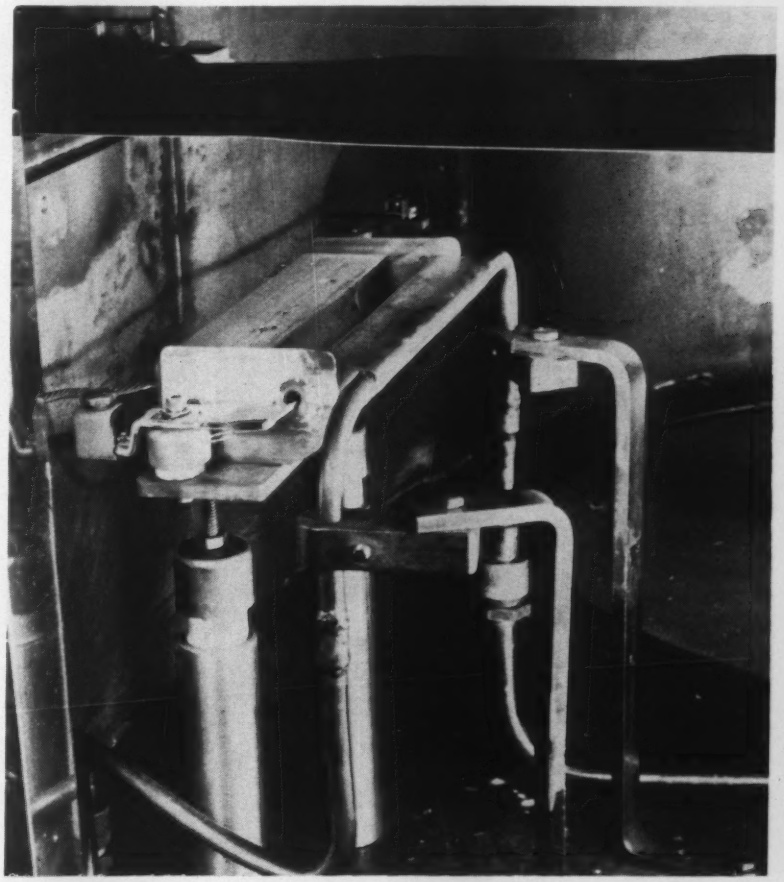
Faster Feed Needed—The unit's line speed can be set at several thousand feet per minute. This represents a large improvement over all known methods. Actually, line speeds are limited by the rolling equipment used and not by the process itself.

Heating is almost instantaneous. There is no lag time as in conventional furnaces. The furnace heats the strip stock uniformly, or even non-uniformly if necessary, by simply adjusting the electron gun controls.

The company plans to offer the furnace on a custom-made basis. Thus, line speeds will vary with the materials to be annealed and the equipment available at the time.

Looks To Future — Eventually, the system may find its way into less exotic applications. This would include the industrial production of sheet metal that must be processed at high temperatures and in non-contaminating atmospheres.

Already, there has been quite a bit of interest shown by large companies in the metals field. These include producers for both military and non-military products.



ACTIVE ELECTRONS: The electron beam furnace processes several thousand feet of strip per minute under vacuum. A coil of strip stock unwinds and feeds into the furnace chamber, passes over the electron beam gun, then exits and rewinds at the other end of the furnace.

Foundry Expands in Tight Space

In a crowded city, foundry expansion can only go so far.

Faced with no growing space, one company decided to build a new plant from the ground up.

Automation in this new foundry yields major benefits.

■ One of the world's most modern foundries has just been completed in New York City. This 50,400 sq ft installation, new from the ground up, boasts a capacity of 45,000 bronze castings per eight-hour shift.

Cast parts at this new foundry, home of the Neptune Meter Co., range from tiny one-ounce pieces to 440-lb giants.

When full production is reached, the output will be 27,600 lb of bronze pressure-type castings per shift. These castings will consist of gaging chambers, housings, and other vital parts for water, industrial and petroleum meters.

Sand Movements — The new foundry building measures only 180 x 280 ft. A stainless steel structure towers over this building and serves as the major sand-storage area.

Four 75-ton hoppers in this tower feed two 4000-lb mullers. These mullers discharge sand to a Cleanerator. After cleaning, the sand is loaded on a 192-ft conveyor belt which feeds the molding stations.

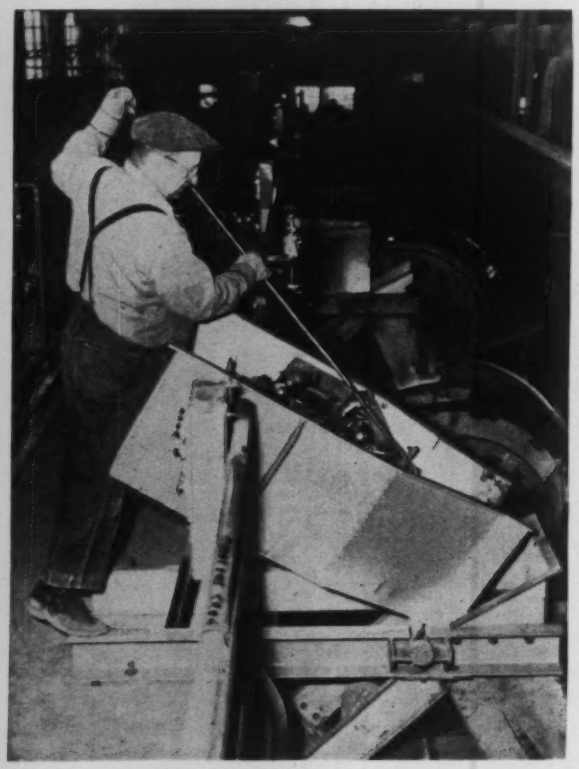
When the foundry begins full-scale operations, about 300 tons of sand will completely circulate through all production stages. This mass of sand will make one and a half trips around the plant on every eight-hour shift.

Pneumatic Conveyors — Located outside the plant proper are two 75-ton capacity sand silos. They're used to make cores. A pneumatic conveying system pipes this sand over the main building's roof to a small muller. Sand is then drawn from either silo as desired.

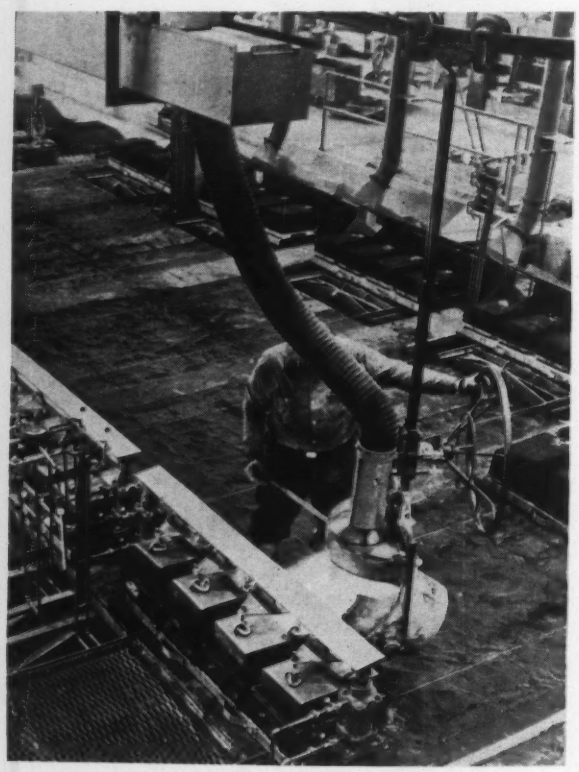
All sand, pig-metal and casting movements are completely automated throughout the foundry. A carefully-planned flow pattern provides a complex transportation network by conveyor belt and Monorail.

This network insures production flexibility, safety, ease of handling, efficiency and freedom from physical labor.

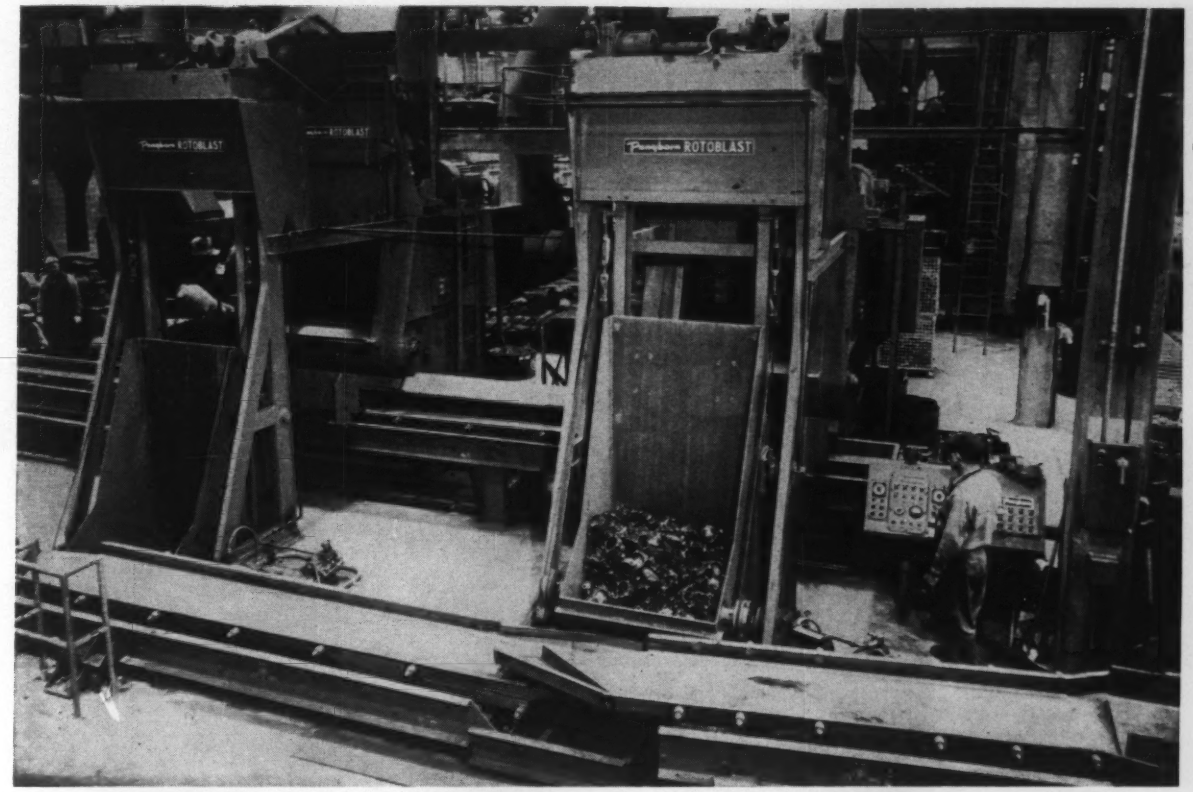
Speeds Molds—In the molding line, there's an automatic molding machine. It's one of the first such machines to be installed in an



CHARGING OPERATION: Foundry man charges carbon-arc rocker-type electric furnace with bronze.



NO FUMES: As the operator pours molten bronze, overhead flexible exhaust hose carries off the fumes.



CLEAN CASTINGS: A load of parts enters one of the cleaning machines. Leaving this machine, the parts move on a belt to an inspection room. After casting work is completed, the metal undergoes a series of tests.

American foundry. With a capacity of 220 molds per hour, this machine can be dialed to a pre-set time cycle.

The automatic moldmaker rams both cope and drag molds simultaneously. It completes green sand molds in only 12 seconds. The largest flask size that can be accommodated measures 20 x 28 in.

There are five other molding lines. They consist of: Five jolt squeezers; two pairs of jolt-squeeze strip machines; two jolt rollers on a split-pattern flask; a Hydroslinger; and a hard-ramming section for specialty molds.

Ready to Clean—After the molds are poured, they drop onto a vibrating conveyor. Then they move along to a shakeout, where sand and cores separate from the castings. An inclined-apron conveyor carries the castings to a cleaning room.

Several cleaning operations and various equipment team up to finish the castings. Exact cleaning cycles hinge on the size and type of castings being produced.

Another conveyor belt carries the castings from shot-blasting stages to inspection tables. After they're sorted, any imperfect units return to the furnaces for remelting.

Five Furnaces — A 440-460 v primary supplies power to a battery of five electric melting furnaces. These five melting units include: Two 2000 lb per hour Ajax induction furnaces; one 1500 lb per hour Detroit carbon-arc heater; and two 1200 lb per hour Detroit carbon-arc furnaces.

Now, let's move along to quality controls. A well-equipped lab analyzes all metal and sand. The molding sand is checked for moisture, permeability, green compression, clay content, grain size and loss on ignition.

The core sand gets the same checks with the exception of the green-compression tests. All core sand is also tested for dry compression and dry shear.

Thorough Checks—The metal is analyzed when it's received. It undergoes additional tests after it's cast. Metal content is checked for copper, lead, tin, nickel, iron, phosphorus, antimony, aluminum, sulphur, silica and manganese.

An efficient ventilating system produces a comfortable, clean atmosphere within the foundry. Suction ducts remove smoke and fumes. These ducts feed into Pangborn precipitators located on the roof.

These precipitators handle a volume of 155,000 cu ft of air per minute. They're highly efficient in removing all objectionable fumes prior to exhausting the air into the atmosphere. Suction ducts funnel all furnace, ladle, shakeout and sand fumes to these collectors.

WALL CHECK: Ultrasonic gage listens for the sound that will tell the operator to accept or reject.

Sound Gages Chem-Milled Tube

An ultrasonic thickness gage could be the answer to your tough inspection problem.

The unit allows direct readings on hard-to-get-at areas.

■ How do you measure the wall thickness of 13½-in. OD tubing at any point along its 20-ft length, to micrometer accuracy? Faced with this question, Altamil Corp., Indianapolis, found the answer in ultrasonic-resonance gaging.

The Vidigage, made by Branson Instruments, Inc., Stamford, Conn., permits thickness checks even when access to only one side is possible.

With this instrument, the thickness of tubing, large sections, sheet-metal, and hollow-cylindrical parts can be determined quickly and accurately, at any precise location.

Weight Reduction — Altamil Corp. uses chemical milling to fabricate parts with improved strength-to-weight ratios for supersonic aircraft, rockets and missiles. This process provides weight reductions in metal parts by etching them in acid-filled tanks.

Chemical milling makes major weight reductions of complex patterns possible. It also permits milling both sides of contoured or formed parts at the same time.

The process achieves various depths of cut by progressive unmasking. This eliminates the need for finishing operations. By ultrasonic gaging, the milling action can be checked quickly.

How Gage Works — The Vidigage's ultrasonic resonance makes direct-reading thickness measurements from 0.005-2.7 in. Accuracies of 0.1 pct are easily held. Even more accurate readings are possible with automatic recording units. Thicker sections can be gaged by extrapolation.

A piezoelectric transducer converts the electrical impulses into mechanical vibrations. When the transducer contacts one surface of the metal under test, inaudible sound waves are sent into the metal.

Returning waves in the metal are picked up by the transducer and fed back into the electronic circuit. Here, resonant frequencies are amplified to show up as one or more traces on a cathode-ray tube.

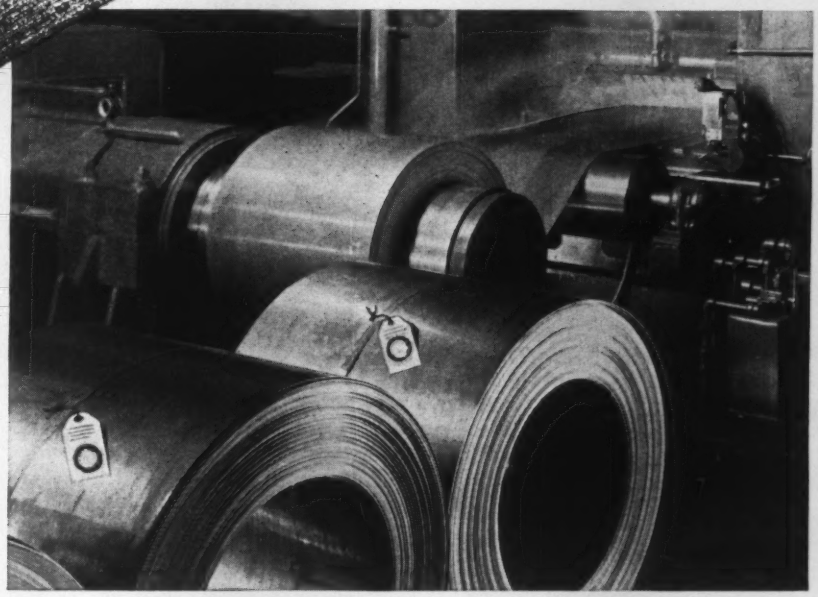
Direct Reading — A calibrated scale in front of the tube permits direct thickness readings. Connected to automatic control equipment, the instrument boosts production rates and improves overall accuracy.

Essentially the gage measures the distance from the surface to the first discontinuity. Thus it may also be used for detecting laminar flaws and weak bonds in clad or roll-bonded sections, as well as for corrosion inspection.

RED CIRCLE SERVICE

...GIVES BIG THRUST TO ORDERS AT

Acme-Newport Steel



Tell us you need steel in a hurry, and we stamp a big red circle on your order and immediately put it into orbit around this mill. When you're caught with your inventories down, Acme-Newport goes all out with an unusual combination of modern facilities, convenient central location and flexibility of operation and scheduling, to ensure your getting what you want when you want it. *Red Circle Service* safeguards quality at every step, too, while filling gaps in your inventory before they become critical. Give us a call and we'll prove it!

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

Steel

PRODUCTS OF ACME-NEWPORT STEEL

Hot Rolled Steel in Coil	Cold Rolled Steel in Coil	Plates (5/16" *and lighter*)
Hot Rolled Pickled Steel in Coil	(*full hard only*)	Electrical Sheets
Hot Rolled Sheets	Cold Rolled Sheets	Electric Weld Line Pipe
Hot Rolled Pickled Sheets	Alloy Sheets and Plates	Spiral Welded Pipe

FOR QUALITY... PRODUCTIVITY ... PROFIT

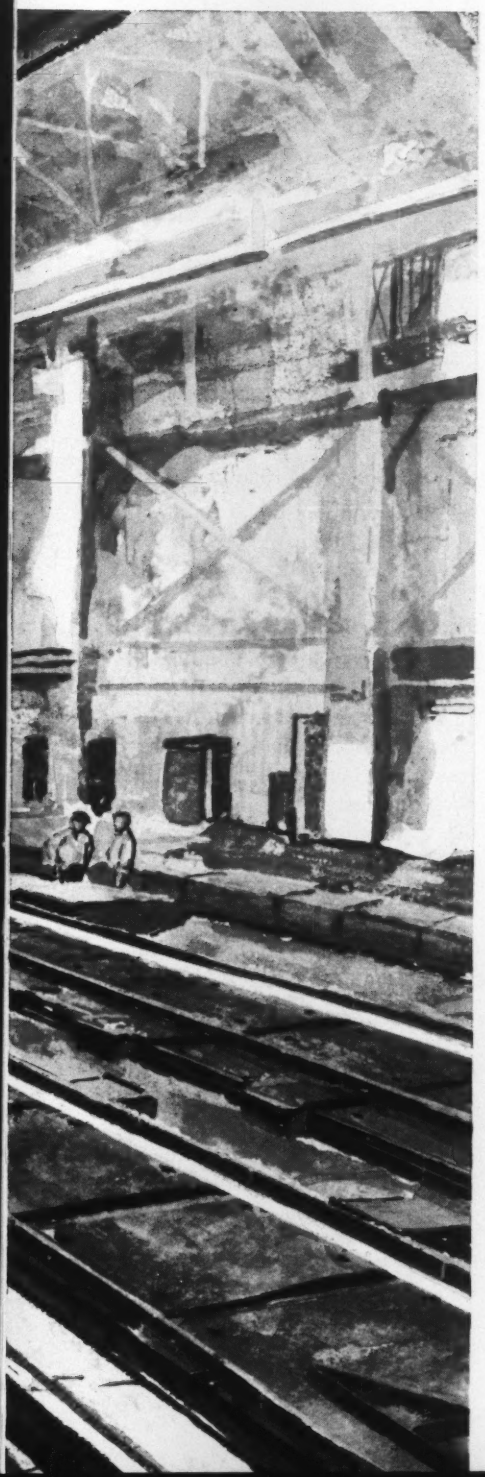
METAL ROLLING
AUTOMATED BY GENERAL ELECTRIC

NOW . . . SILICON-CONTROLLED

New SCR drives from increase reliability,

RECTIFIER SYSTEMS FOR STEEL MILLS

General Electric reduce maintenance, take up to 50 percent less floor space



General Electric now offers steel mill drive systems for field excitation and armature supply featuring the reliability and fast response of silicon-controlled rectifiers. More than two years of successful application of SCR's by General Electric in varied industrial situations has proved their long life and high efficiency in mill conditions: SCR's are unaffected by dust, moisture, shock, or vibration. Look at these cost-cutting and profit-producing benefits:

Higher reliability—SCR's are solid-state semi-conductors with no tubes, relays, or other moving parts. SCR's have longer operating life, so downtime for maintenance is significantly cut.

Reduced floor space—up to 50 percent less than previously required for drive systems . . . space can be made available for other purposes or construction costs can be cut on new buildings.

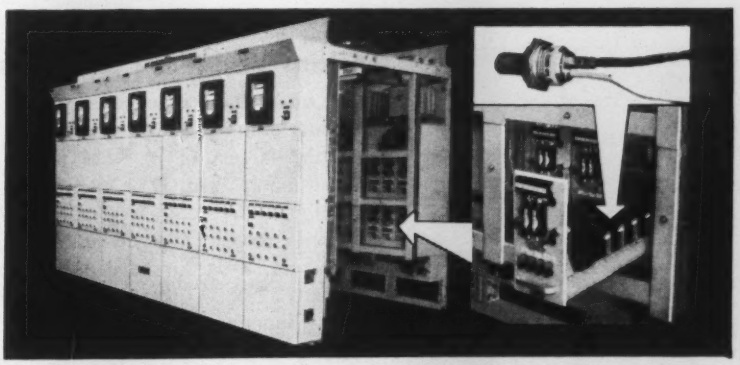
Quicker response—to signal deviation provides more accurate speed control. SCR's require no warmup before operation.

The application of silicon-controlled rectifier drives in steel mills is another example of how General Electric has served the steel industry for 75 years with products and systems to help make steelmaking faster, more efficient, and more profitable. Your General Electric sales representative is ready to assist you in planning for automation in existing facilities or in new mills . . . not only with systems using SCR's but with complete electrical systems for all process controls. Or, for additional information on SCR systems, write Section 785-16, General Electric Co., Schenectady, N. Y.

Industry Control Department, Salem, Virginia

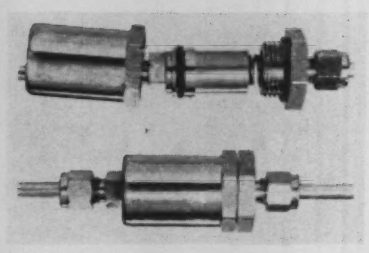
Progress Is Our Most Important Product

GENERAL ELECTRIC



COMPACTNESS of G-E silicon-controlled rectifiers permits complete panel assembly and testing before shipment. Field installation and maintenance is facilitated because like functions can be grouped, faults quickly located.

New Materials and Components



In-Line Filter Design Speeds Element Changes

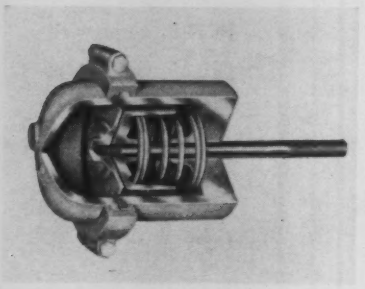
Here's an unusual filter design that let's you replace the filter element without removing the filter housing from the system. This up-to-date method drastically cuts downtime when elements wear out. The newcomers also feature sintered stainless-steel elements that prevent flaking. Thus, there's no danger of downstream contamination. Various micron-sized elements are available to meet specific filtering needs. (Nuclear Products Co.)

For more data circle No. 25 on postcard, p. 129

Twin Graphite Blocks Team Up as Steel-Slab Mold

Two 360,000-lb graphite blocks are slated for duty with the American Shipbuilding Co. They'll serve as a permanent steel-shaping mold. Measuring 2 x 6 x 27.75-ft, the twin blocks hold the title of "largest ever produced." They will provide the backbone needed to form giant steel slabs, which are scheduled for casting by the pressure-pouring process. American Shipbuilding has great hopes for this technique. It anticipates definite economic advantages. Expectations are that use of pressure pouring will lead to significant savings. (Electrode Div., Great Lakes Carbon Corp.)

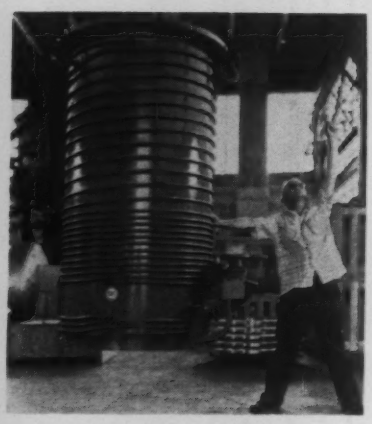
For more data circle No. 26 on postcard, p. 129



Friction-Free Stroke Means Fast Control Response

This air-operated, actuator responds in a hurry to slight air-pressure changes. It's ideal for sliding-stem valve operation, rheostats, speed reducers and automatic air-clamping mechanisms. In fact, it fits in with any unit which can be controlled by reciprocating motion. Key to performance is the fact that there's no starting friction. The actuator's advanced design eliminates all metal-to-metal contact. It's piston never touches the cylinder wall. Instead, a long-stroke rolling diaphragm prevents air loss between the cylinder wall and the piston. (RKL Controls, Inc.)

For more data circle No. 27 on postcard, p. 129



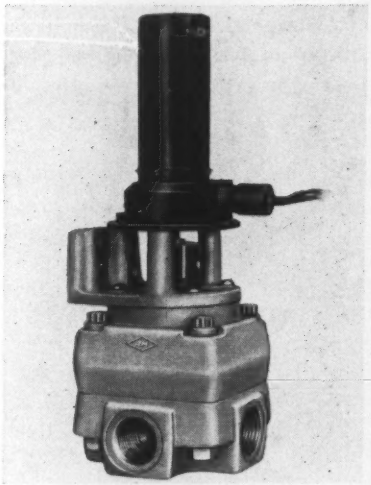
Giant Vacuum Pump Simulates Space-Age Altitude

A huge 32-in. diam, oil-diffusion vacuum pump is now in production. It's the largest of its kind in the high-vacuum field. The pump was developed specifically for fast evacuation of giant space-simulation chambers. Plateau speed is a consistent 52,000 liters per second throughout the 3×10^{-5} to 4×10^{-4} mm-Hg pressure range. Ultimate pressure is 2×10^{-9} mm-Hg, and backstreaming rate is only 0.194 mg/cm^2 per hour. This performance is due in part to an unusual 4-stage nozzle. It directs oil vapor in a dense stream at supersonic speeds. A new heater assembly also contributes to high output. Annular aluminum rings with cast-in tubular heaters fit into concentric wells. These wells form three interconnected compartments inside the pump. Rapid convection in the compartments minimizes fluid loss. (Consolidated Vacuum Corp.)

For more data circle No. 28 on postcard, p. 129

Remote Valve Control

For remote control on a line of valves, a new, rotary-electric actuator features direct drive through a

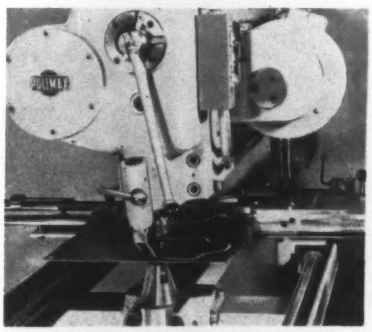


precision planetary-gear train. The actuators fit Republic Mfg. Co.'s Type-"B" Lo-Torq Valves in up to 1-in. sizes. No modifications are necessary for factory or field installation. Positioning is positive and accurate, with an operating time of ¾ seconds for 45° sweep. Ninety-degree movement takes 1½ seconds. In addition, motor and valve readily disengage for manual override. (Republic Mfg. Co.)

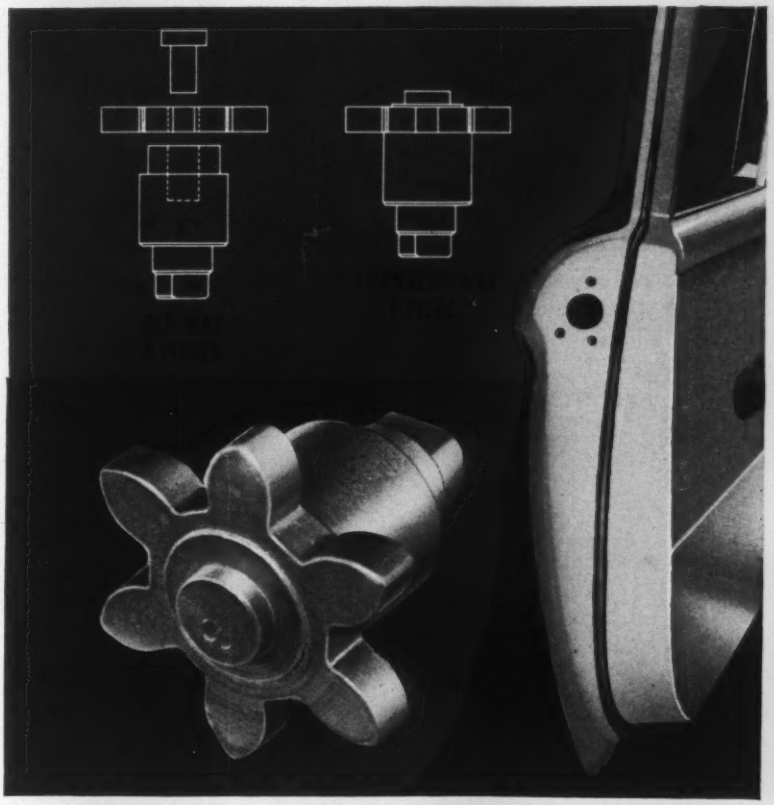
For more data circle No. 29 on postcard, p. 129

Duplicates Templates

Here's a new grinding attachment that installs and removes in a matter of minutes. It fits on



American Pullmax Co.'s P-model machines. In operation, the new attachment duplicates any shape from a template. It also handles circles, square holes, slots, rings and hole punching. Smooth-running



Auto maker saved $22 per thousand with Townsend Ultra-Special part

This Ultra-Special part is made by the Townsend Ultra-Special cold-forming process for $22 less per thousand pieces than the former three-piece assembly made by another method.

One of these automobile door latch rotors is used in each car door by a major manufacturer. Their annual savings—by using this part—is quite substantial.

Cold forming adds strength to make a tougher part while holding dimensional tolerances. In developing these Ultra-Special parts, Townsend's engineers combine such processes as cold-heading and impact extrusion—or, interim heat treatments and coatings. The result is an extended range of standard production equipment far beyond ordinary limitations.

You benefit directly by using Townsend Ultra-Special parts in the assembly of your products. Your increase in profit potential is a direct combat to competition. A Townsend engineer will be happy to discuss your production assembly. Write Townsend Company, P. O. Box 71-B, Ellwood City, Pa.

Townsend Company

ESTABLISHED 1816

Engineered Fasteners Division

ELLWOOD CITY • PENNSYLVANIA

In Canada: Parmenter-Bulloch Manufacturing Co., Limited, Gananoque, Ontario

ball bearings ease the attachment's motion in every direction. (American Pullmax Co., Inc.)
For more data circle No. 30 on postcard, p. 129

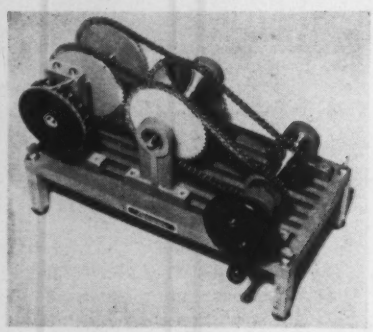
Signals Shaft Position

This new unit converts angular-shaft displacement into electrical signals for digital readout. In one

360° rotation of the shaft, it defines 2048 unique positions with a resolution of 10.55 minutes of arc per step. Since moving parts have been practically eliminated, top reliability is assured. For example, the unit contains no gears, brushes, tubes or transistors to go wrong. (A R & T Electronics, Inc., a subsidiary of The Baldwin Piano Co.)
For more data circle No. 31 on postcard, p. 129

Defeats Slippage

Supplied in Type 18-8, non-magnetic, stainless steel, new 0.1475 pitch chain comes in lengths ranging from 5.900 - 57.525 in. Special lengths are available on request. It's ideal for use in all servomechanism, data-recording, or mechanical-motion applications. Among its advantages are lack of slippage, noise and excess backlash. It also offers high reduction with an extremely-low torque factor. Of course, light weight helps too. To best meet operating needs, all sprockets may be



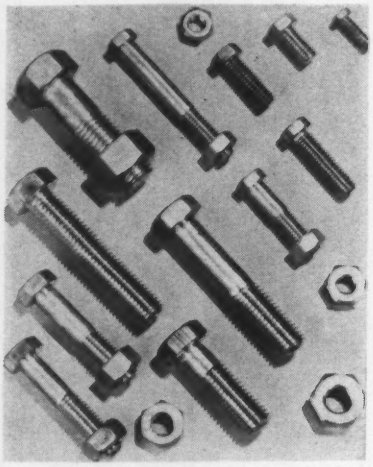
ordered in stainless steel, aluminum, linen phenolic or nylon. (PIC Design Corp.)
For more data circle No. 32 on postcard, p. 129

Compressor Aid

With only one moving part, a new device maintains air-compressor receiver pressure within one lb of any given setting. And it does this while the compressor is operating. At the same time, the newcomer increases volumetric efficiency as much as 10 pct. In operation, most air compressors are either pumping up to full capacity, or idling. At such times, receiver pressure varies as much 10-20 lb. Using one of the new governors, the load motor is always in direct proportion to the air demand. This results in a lower overall-load factor. (Trymac Corp.)
For more data circle No. 33 on postcard, p. 129

Space-Age Fasteners

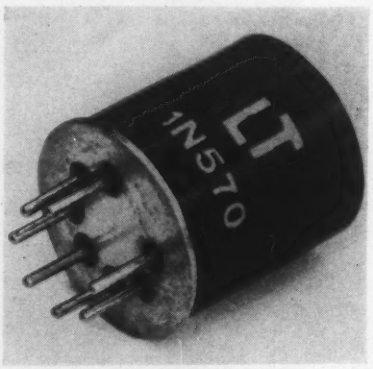
An expanded line of aluminum, silicon - bronze and stainless - steel



fasteners complements a broad line of conventional steel and non-metallic units. Traditional and specially-designed units are being developed. In the new materials, these units will meet requirements for high corrosion resistance, high strength-to-weight ratio and light weight needed in many modern applications. (Russell, Burdsall & Ward Bolt and Nut Co.)
For more data circle No. 34 on postcard, p. 129

Tube Replacements

Here's a new line of tube-replacement rectifiers that offer high effi-



ciency, small size and low-heat output. They also feature the long life inherent in silicon rectifiers. Of course, they can be used in new designs as well as for replacing tubes

IMPORTANT
SAVINGS
Lower initial cost
Long life
Ultra high quality
Small Diameter
ROLLS
Special alloys with tough, fine-grained finish. Surfaces as fine as 3 micro inches RMS. Chrome plating available.
RECONDITIONING:
Rolls reconditioned like new at costs averaging 25% of new rolls. Rolls can be reconditioned several times!
Voss
ENGINEERING CO.
7301 Penn Ave. Pgh 8, Pa.
Churchill 2-4422

now in use. All-welded construction makes them rugged. In addition, they mount in any position. (Ling-Temco Electronics, Inc.)

For more data circle No. 35 on postcard, p. 129

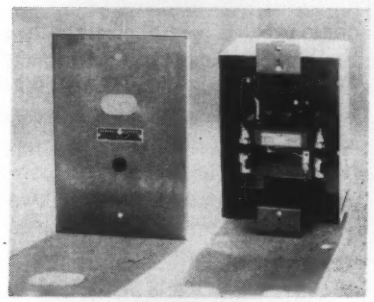
More Bounce

For highly-stressed springs, a new stainless-steel spring wire has tensile strengths up to 100,000 psi higher than music-spring wire. Potential applications for the new material include springs for jet engines, food and beverage equipment, and chemical equipment. A higher tensile strength means smaller springs will handle a given load. The stainless wire suits compression and extension springs. (National Standard Co.)

For more data circle No. 36 on postcard, p. 129

Magnetic Starters

Flush-mounted magnetic starters for machine tools and contractor in-



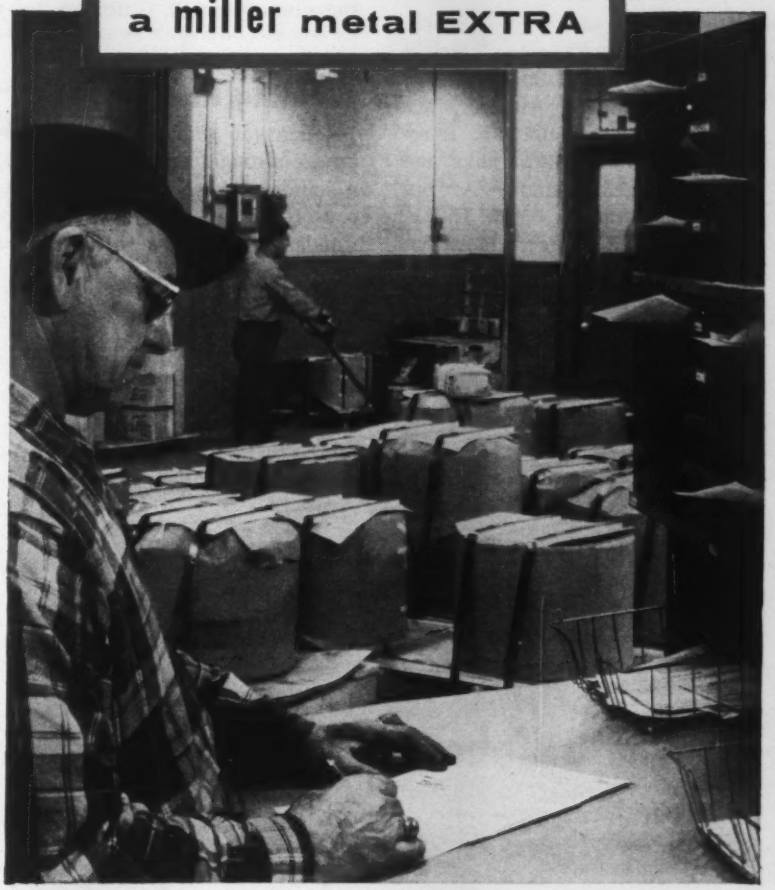
stallations have been added to a line of motor controls. Available for cavity mounting in machinery, or for mounting in plaster walls, the new forms are rated up to 600 v. For machine-tool applications the starter comes with a mounting bracket and a front cover. When rigid conduit or BX cable is used, the bracket's eliminated. Then the starter comes in an enclosure. Adjustable mounting ears on the outside of the enclosure fasten it to the machine. (General Electric Co.)

For more data circle No. 37 on postcard, p. 129

Cleans Aluminum

Silicate residues, which remain after cleaning aluminum in silicated non-etching cleaners, often interfere with subsequent anodizing, chro-

a miller metal EXTRA



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DELIVERY YOU CAN COUNT ON

When you order metal, you want it when it's promised. Miller makes sure it's there when you need it . . . by truck, train, or even plane, if necessary. We're proud of our record—98.8% of our promises were kept in 1960, and we'll do even better this year. This personal concern is typical of the service every customer receives from Miller. None of us ever feel we've completed your order until your metal is in your plant, on your machines and satisfactory in every way. Whenever you need brass, bronze, or nickel-silver strip, copper or copper-alloy tube in special shapes and sizes call on the specialists at Miller . . . where you're a name, not just a number on the job ticket.

ROLLING MILL DIVISION
Meriden, Connecticut

miller SINCE 1852

Tube Subsidiary
A. H. WELLS, INC.
Waterbury, Connecticut

mating or bright dipping. But a newly-developed, alkaline-soak cleaner contains no silicates, nor does it etch the aluminum. It removes light soils, marking inks, and light-buffing compounds. At operating temperatures below 150°F, there's no etching effect. However, over that temperature, very-mild controlled etching can be accomplished. Detergency is good in both temperature ranges. (Enthone, Inc.)

For more data circle No. 38 on postcard, p. 129

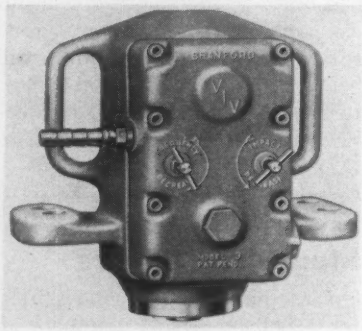
Welding Rod

When you want to weld silicon-bronze wrought and cast materials, it stands to reason you need a silicon-bronze rod. Now available as a standard item, a new silicon-bronze rod handles weldable grades of copper and copper alloys as well. In addition, the new rod has many applications involving plain and galvanized steel. It suits tungsten-inert gas (Heliweld), carbon arc, and oxyacetylene welding processes. Standard packages weigh 50 lb and hold 36-in. rods in diameters ranging from 1/16-5/16 in. (Air Reduction Sales Co.)

For more data circle No. 39 on postcard, p. 129

Pneumatic Vibrator

Here's a new vibrator that changes impact and frequency,



either independently or together. In addition to self control, the unit has ultra-high impact amplitude. In fact, kinetic energy has exceeded 20,000 Gs in acceleration tests. Test results indicate it will be an effective impact device in compacting powdered metals and ceramics. Other uses are apparent in materials handling. For instance, the vibrator is a natural for moving powdered or granular materials in bins and hoppers. (The Branford Co.)

For more data circle No. 40 on postcard, p. 129

Regulates Pressure

A new differential-pressure regulator is available from stock in ductile iron or bronze. It comes in ¼, ⅜, ½ and ¾ in. sizes. The regulator maintains a constant differential between a medium passing through it, and any other medium loaded on top of the diaphragm. It enjoys wide usage in the paper, chemical and other processing industries. Steam, water, air, oil, gas or chemicals pose no problems for the newcomer. In addition, the units handle 250 psi at 450°F, and 300 psi at 150°F. Self-cleaning, stainless-steel valves are standard along with all-metal construction. (OPW-Jordan Co.)

For more data circle No. 41 on postcard, p. 129

with 35 years of experience in the production of mild steel wire rods, and a proud record of being the first to produce hard steel wire rods in Japan over 30 years ago.

Kobe Steel, with the complesion of its new No. 5 mill in June of 1961, now has production capacity of 740,000 tons annually and is known as the oldest, largest and most versatile manufacturer of steel wire rods in the Far East.

Particularly famous for the high quality of its hard steel and special steel wire rods, Kobe Steel exports to every major area of the world.

KOBE STEEL WORKS, LTD.

Head Office: Kobe, Japan Cable: "KOBESTEEL KOBE"
New York Office: 80 Pine St., New York 5, N.Y., U.S.A.
Düsseldorf Office: Immermann St., 10, Düsseldorf, West Germany

Main Products: Wire Products — Plain and Galvanized Iron Wire • Barbed Wire • Wire Nail • Wire Rope • Strand Wire for Prestressed Concrete • Bars, Pipes and Tubes • Arc Welding Electrodes • General Machinery

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Beryllium-Copper Strip

This data sheet deals with a heat-treated, beryllium-copper strip recently introduced on the market. Thermal-stress relief, forming and joining procedures are described. It also gives instructions for pickling and plating. (The Brush Beryllium Co.)

For free copy circle No. 1 on postcard

Case-Study Portfolio

The second in a series, this case-study portfolio takes up the effects of fatigue-resistant steel bars on end costs in typical-parts applications. It reveals dollar-and-cents savings in individual studies. (LaSalle Steel Co.)

For free copy circle No. 2 on postcard

Circuit-Breaker Guide

When a company makes a complete line of products, it sooner or later faces a basic problem: How to make it easy for the customer to select the exact model that fits his needs. Westinghouse Electric Corp. came up with a solution for their circuit-breaker line. It's a handy selector disk that operates on the circular slide rule principle. At a glance, the customer can select the right unit.

For free copy circle No. 3 on postcard

Press to Start

Revised to include the latest information, a four-page catalog covers a complete line of cast-iron foot switches. Diagrams show contact operation. A selection guide includes nomenclature, stages, contact arrangement and pedal operation. (General Electric Co.)

For free copy circle No. 4 on postcard

A Look at Ductile Iron

New applications for ductile iron are put in use almost daily. And here's an attractive brochure that delves into some of the reasons why. It discusses the properties that have led world production of this material to double since 1959. (Kutztown Foundry & Machine Corp.)

For free copy circle No. 5 on postcard

Self-Sealing Couplings

What are the common uses of self-sealing couplings in fluid-coupling systems? The answers to this question and many others are contained in a handy, 20-page bulletin devoted to a general discussion of typical applications. (Aeroquip Corp.)

For free copy circle No. 6 on postcard

Checks Intricate Parts

Foldout literature covers the salient points in a line of optical comparators. These units feature precise optical systems with projection lenses that are matched and pre-set for exactly-rated magnification. (Jones & Lamson Machine Co.)

For free copy circle No. 7 on postcard

Needle Valves

In three colors, a four-page circular tells all about a line of space-saving needle valves. Completely illustrated, it includes both sectional and exterior views, plus complete dimensions. (The Lunkenheimer Co.)

For free copy circle No. 8 on postcard

Precision Adjusting

Fully-illustrated with phantom and exploded views, a new 16-page catalog covers three types of precision-adjusting tools. The new-

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FREE LITERATURE

comers allow delicate adjustments in tenths, without loosening or tightening any screws. (Briney Mfg. Co.)

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Multiple Operations

New, multiple-second-operation machines are the subject of a 10-page bulletin hot off the press. It relies on case-history examples to illustrate the cost reductions possible with this type of machine. Typical secondary-machining operations are listed. (Standard Tool & Mfg. Co.)

For free copy circle No. 10 on postcard

Firing Technique

A new, yet fully-proven firing technique for ceramic kilns and other processes, is described in a recently-published, illustrated pamphlet. In 12 pages, it discusses a process which permits temperature uniformity during the complete heating and cooling cycle. (Bickley Furnaces Inc.)

For free copy circle No. 11 on postcard

Edges and Blades

Straight edges, magnetic blocks and centerless-grinder blades are the subject of an attractive brochure. It also includes data on cutting-tool inserts, tipped tools and standard-cutoff blades. Most specifications are summarized in easy-to-read tables. (The Ohio Knife Co.)

For free copy circle No. 12 on postcard

Disc-Grinding Machines

The latest developments in high-production, disc-grinding equipment are shown in a new, 28-page catalog. It discusses models for grinding a great variety of parts, from gage blocks and bathtubs to coil springs and cylinder heads. (Besly-Welles Corp.)

For free copy circle No. 13 on postcard

Gray-Iron Guide

The Gray Iron Founders' Society, National trade association in the gray and ductile-iron fields, has just released its new Buyers Guide and Directory of members. The new 1961 (June) Directory, entitled "Where to Buy Gray and Ductile Iron Castings," contains three distinct sets of data: An alphabetical list of members, a geographical listing and a list of foundries under products manufactured.

For free copy circle No. 14 on postcard

Industrial Floor

In a 4-page factsheet, industrial-flooring materials come under scrutiny. The literature points out the many advantages of a hard black mastic. Ease of installation, low first cost and truly-remarkable wearing properties all spell good news to the prospective floor purchaser. (Permaflex Products Co.)

For free copy circle No. 15 on postcard

Refining Fluxes

New free literature explains the need for protecting turnings, borings, chips, drosses and other residues during remelting. This guards against excessive-metal loss. The technical leaflet describes covering and refining fluxes that accomplish this protection. (Foseco, Inc.)

For free copy circle No. 16 on postcard

Resists Corrosion

In 16 pages, a new bulletin describes a complete line of corrosion-proof cements, flooring materials, interliners, coatings and rigid-plastic fabrications. Resistance data on 166 common corrosives for all 17 products are given in an easy-to-read chart. (Atlas Mineral Products Co.)

For free copy circle No. 17 on postcard

Aluminum Alloy

The unusual combination of characteristics available in a new aluminum-casting alloy is the subject of an eight-page bulletin. The alloy boasts high-strength and good shock-resistance. It's for use where high-yield strength and low elongation are strict requirements. (William F. Jobbins, Inc.)

For free copy circle No. 18 on postcard

Industrial Manifolds

A comprehensive, 12-page catalog describes a complete line of industrial-gas manifolds. Included are 21 stationary models. In addition, two portable manifolds are covered. These units handle just about any industrial gas. (Linde Co., a div. of Union Carbide Corp.)

For free copy circle No. 19 on postcard

NEW PATENTS

Deoxidizing Briquette

Method for making briquettes to treat molten metals and alloys, F. J. O. Hurum, June 13, 1961. A briquette that is useful for deoxidation, desulfurization and degassing of cast-iron melts, and for the formation of spherulitic graphite in cast iron, comprises either about 30 pct metallic magnesium powder and 70 pct coke or about 25 pct metallic-magnesium powder and 75 pct of an alkaline earth-metal oxide. U. S. 2,988,445.

Sintering Machine

Combined, continuous - sintering and cooling machine, P. J. Homan (assigned to Koppers Co., Inc.), June 6, 1961. The patent covers a design for an integrated iron-ore sintering, cooling, crushing and screening installation. Its top strand handles sintering and the return strand takes care of cooling. U.S. 2,987,307.

Steel-Making Method

Method for producing steel, P. L. Metz (assigned to A.R.B.E.D., Soc. Anon., Luxembourg), June 13, 1961. Patent covers a method for producing steel from pig iron. An oxidizing gas, containing a granular or powder dephosphorizer, is injected at high pressure through the nozzle's inner conduit. At the same time, an oxidizing agent without a dephosphorizer is injected onto the slag under low pressure. U. S. 2,-988,443.

Processes Metallic Ore

Improvements in the processing of metallic ores, S. Klemantaski, T. W. Johnson and J. M. Ridgion (assigned to British Iron & Steel Research Association, London, England), Apr. 26, 1961. This patent covers a method of reducing unagglomerated iron-oxide ore fines in a high-temperature reactor. The gas produced by the burning fuel serves as the reducing agent. Ore is melted, and the off gases are used in a pre-reduction zone to partially reduce additional ore. British 866,-646.

Fluidized-Bed Solids

Improvements in, or relating to, the passage of solids between fluidized beds (assigned to Instituto Nacional de Industria, Madrid, Spain), Apr. 12, 1961. In a design for a fluidized-bed apparatus for roasting iron-oxide ores, the overflow pipes are relatively short. This reduces the height of the installation. British 864,991.

Iron-Aluminum Alloys

Iron-aluminum base alloys, J. J. Mueller and F. G. Tate (assigned to U. S. Atomic Energy Commission), June 6, 1961. A ductile alloy with superior resistance to high temperatures and water corrosion comprises 4-10 pct Al, 2-8 pct Cr, 1-5 pct Cb, 0.5-3 pct Zr, and the remainder substantially all Fe. U.S. 2,987,394.

Treats Molten Metals

Improvements in a process and apparatus for treating molten metals, R. Shields, Mar. 22, 1961. In a process for treating molten pig iron with oxygen, the ladle or mold is covered with a hood, and the enclosed space flushed with nitrogen or other inert gas. Oxygen is added to the melt during flushing, and the resulting gases are drawn off through the hood. British 863,675.

Hydrocarbon Reduction

Reduction of iron ore by hydrocarbons, G. Tanner, June 13, 1961. A method for reducing iron ore at low temperatures employs hydrocarbon gases. Partially-reduced ore containing metallic iron contacts the gases at 530°-580°C. As the gases decompose into hydrogen and carbon, the remainder of the metal oxide is reduced. U. S. 2,988,442.

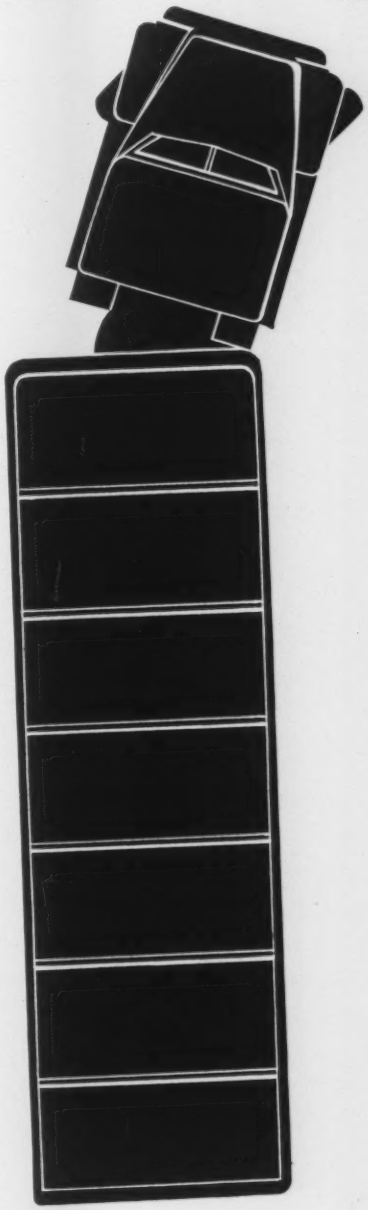
Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

Look Ahead...

. . . for an example of Allegheny Stainless at work in a specific market application, featuring the fabricated products of Allegheny Ludlum customers.

Check the next two pages which also appear in the current issues of FLEET OWNER, COMMERCIAL CAR JOURNAL, AUTOMOTIVE NEWS, and TRANSPORT TOPICS.

It's just another case of how Allegheny Stainless can work for you . . . in your products . . . in your markets . . . in your merchandising efforts. 3300



Fruehauf's Stainless Steel Trailer is ahead by a country mile

New price reductions promise even more stainless units on the roads

Advanced engineering and manufacturing techniques in the production of the premium semi-trailer on the highway today . . . Fruehauf Stainless Steel Vans . . . have made possible reduced prices on the line. This news is being welcomed by fleet owners and operators everywhere.

Fleet operators have replaced trailers made of other than stainless steel several times over while their stainless units have kept delivering payload with virtually no exterior maintenance. These operators have records full of evidence of the value of stainless trailers and their acceptance of the new price announcement is most enthusiastic.

Perhaps even more interested should be the people who have heard of the better values in stainless trailers but who have

been stopped by the high premium charged for the best.

Fruehauf's new prices now bring stainless trailers within a few percent of the cost of trailers built of other materials. The stainless unit provides even greater hauling profits, combining increased strength and capacity with added years of almost maintenance-free durability.

The new lower prices just announced by Fruehauf were a result of their continual, extensive cost reduction program. Allegheny Ludlum, as the major stainless steel supplier, worked right along with the Fruehauf engineers and production men on this program.

A-L research and application engineers are at your service, too, for counsel on fabrication techniques and the economical use of Allegheny Stainless in your product. *Allegheny Ludlum Steel Corporation, Dept. MID 2, Oliver Building, Pittsburgh 22, Pennsylvania.*

3300

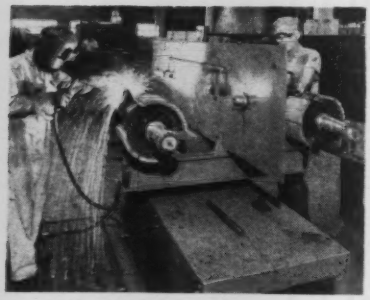
ALLEGHENY LUDLUM

New Equipment and Machinery

Tool Locating Device Ends Tool-Point Damage

One of the most accurate instruments of its kind, a new device combines optical and electronic components to establish tool-point location. It precisely locates the tool point within 0.000025 in. No special operator training is needed for speed and ease of operation. Skill in running the basic machine is all that's necessary. In addition, this precision gage does away with "eyeballing" and tool-point damage. In fact, it eliminates all physical contact with the tool point itself. (The Heald Machine Co.)

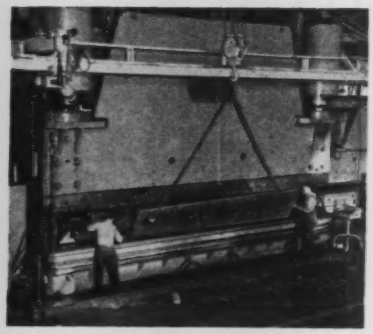
For more data circle No. 50 on postcard, p. 129



Simple Turntable Breaks Welding Bottleneck

Although it's remarkably simple in concept, this heavy-duty turntable may speed your welding operations. It promotes real teamwork between welder and helper. It also provides a safe, fast way to set up and partially automate production. A shield through the center protects the welder's helper. He sets up a job, while the welder completes one. Then an electric control button is pressed to rotate the table 180°. This places the new job at the welder's fingertips. There's no time wasted. Meanwhile, the helper removes the finished job and sets up another. (Logan Co.)

For more data circle No. 51 on postcard, p. 129



Huge Bending Press Delivers 2000 Tons Pressure

The most powerful metal-bending machine of its type ever built has been installed by Hornischfeger Corp. of Milwaukee. With the touch of a button, the monster delivers a whopping 2000 tons of pressure. This is enough to shape sections of super-strength steel measuring 26-ft wide and 1¼-in. thick. For a better idea of the machine's sheer bulk, consider these facts: It covers more than 350 sq ft, rests in a pit 11 ft below the floor and extends more than 21 ft into the air. One thousand gallons are required to fill its hydraulic system. But despite all this, two operators can handle the most difficult and heaviest jobs. (Verson Allsteel Press Co.)

For more data circle No. 52 on postcard, p. 129

Furnace Activates Heating Elements at Random

A new forced-air electric furnace maintains even temperatures without re-cycling. Its thermostat controls up to seven heating elements, depending on the furnace rating. However, it only energizes enough elements to supply the heat needed to satisfy the thermostat setting. Heating elements come on at random, one at a time, until the correct temperature is reached. There are never more elements in operation than are actually needed. Also, each one has its own limit control. This shuts off the element automatically, if overheating occurs. Completely enclosed and insulated with 1-in. thick, vinyl-coated glass wool, the furnace operates vertically, horizontally or upside down. (Westinghouse Electric Corp.)

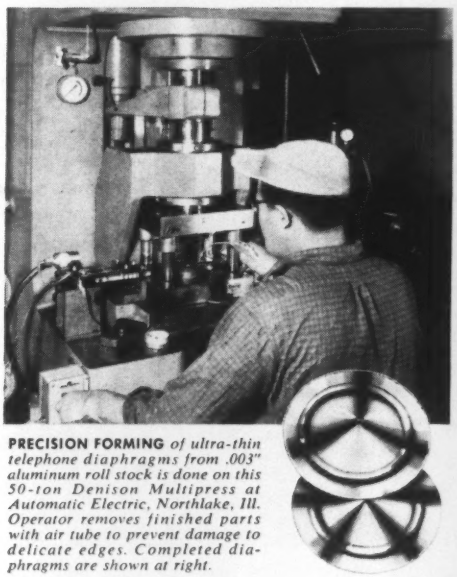
For more data circle No. 53 on postcard, p. 129

Denison, Denison HydrOILics, and Multipress are registered trademarks of Denison Eng. Div., ABSCO

DENISON HydrOILics

How **AUTOMATIC ELECTRIC** uses **DENISON** Multipress to form featherweight phone parts requiring unusually high...

PRECISION



PRECISION FORMING *of ultra-thin telephone diaphragms from .003" aluminum roll stock is done on this 50-ton Denison Multipress at Automatic Electric, Northlake, Ill. Operator removes finished parts with air tube to prevent damage to delicate edges. Completed diaphragms are shown at right.*

PRECISION control and smooth, cushioned hydraulic pressure by this Denison Multipress solved a critical production problem for Automatic Electric, subsidiary of General Telephone & Electronics.

This small aluminum diaphragm is a vital component of Automatic Electric's new 810 telephone receiver. Weighing just a fraction of an ounce and only .003" *thin*, this fragile part proved extremely difficult to produce by ordinary pressing methods. But the job was a *natural* for this 50-ton Multipress—*a giant with a delicate touch.*

In one operation it automatically blanks, forms and perforates the diaphragms from .003" aluminum roll stock. Because of the extra rigidity and stability—as well as accurate control—finished parts come through in perfect shape, well within the .001" tolerance specified. No distortion of the thin diaphragm edges . . . no damage to the costly dies.

It's typical of how Multipress speeds production . . . reduces rejects . . . cuts costs on an endless range of pressing jobs. To learn what Multipress can do for *you*, ask your Denison Production Specialist about a **M**ultipress **A**nalysis **P**rogram in your plant *now*. It can help you **MAP** new ways to boost efficiency and save money in your pressworking operations.

DENISON ENGINEERING DIVISION
American Brake Shoe Company
1242 Dublin Road • Columbus 16, Ohio

HYDRAULIC PRESSES
PUMPS • MOTORS • CONTROLS

DENISON
HYDRAULIC MULTIPRESS

AUTOMATIC BRUSHING SETUP buffs mirror finish on 12" wrench parts for plating. Multiple parts are mounted in special removable fixture. Machine automatically positions and oscillates parts between brushing heads for 25 strokes per cycle. Each head is made up of 65 Osborn Bufcut® treated cord brushes.

MIRROR FINISHING wrenches
nine at a time with OSBORN power brushing

This leading tool manufacturer uses Osborn power brushing to buff a mirror finish on forged steel wrenches, pliers and chisels before plating.

Pre-mounted in multiples on removable fixtures, the tool parts are buffed in a special machine which automatically lowers and oscillates the parts between two Osborn Bufcut® brushing heads. The operation is simple, fast, inexpensive. This method has been in continuous use in this plant for nearly 12 years—*still proves to be the best way to do the job today.*

It's a typical example of how Osborn power brushes and brushing methods—through years of exceptional, dependable service—are handling industry's tough metal finishing jobs. If you have a metal finishing problem—deburring, cleaning, polishing, precision blending—an **O**sborn **B**rushing **A**nalysis, made in your plant at no obligation, can pinpoint the answer. *Write or call The Osborn Manufacturing Company, Dept. F-112, Cleveland 14, Ohio. Phone ENdicott 1-1900.*

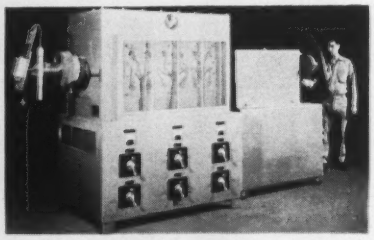
OSBORN

Metal Finishing Machines . . . and Finishing Methods
Power, Paint and Maintenance Brushes • Foundry Production Machinery

NEW EQUIPMENT

Zoned-Tube Furnaces

Both air and controlled-atmosphere models are available in a new line of zoned-tube furnaces. The line features interchangeable components for better versatility. Muffles, chambers, water-cooled sections and other optional features can be removed or replaced to meet changing research or production demands. The controlled - atmosphere units have sliding, counterbalanced doors. Flame seals at the door openings are optional. Also available are

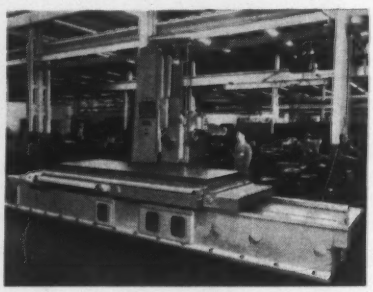


water-cooled sections to provide product cooling in controlled atmospheres. (Harper Electric Furnace Corp.)

For more data circle No. 54 on postcard, p. 129

Milling Machine

Key to the repetitive accuracy of this new machine tool is the accuracy and alignment of its tremendous 24-ft, 33,000-lb, cast-iron bed. In final assembly, the bed winds up flat to within tenths. A host of features distinguish the new-



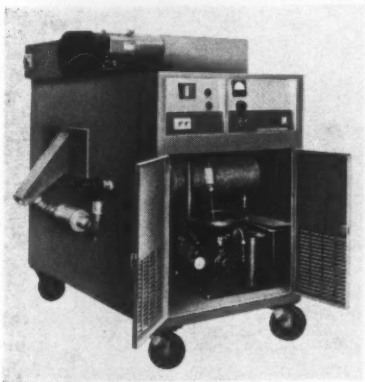
comer. For instance, tool changes are fast. They can be made with the spindle bar in any position within its 24-in. travel range. This is done by a power-lock mechanism which locks and releases in seconds. The machine is also designed for advanced-control systems. It read-

ily adapts to point-to-point, dial-in positioning as well as numerical-tape control. (DeVlieg Machine Co.)

For more data circle No. 55 on postcard, p. 129

Multi-Wheel Cleaner

In a new cleaning machine, parts move automatically through a series of rotating wheels. During the process, the parts are immersed in ultrasonically - agitated "Freon," then rinsed, drained and discharged. Treated parts are clean, dry, and ready for the next operation. To operate economically, any continuous machine using the relatively expensive "Freon" solvents must have a low rate of solvent consumption. This is true of the new multi-wheel cleaner. As parts pass through wash, rinse and dry cycles, the solvent-laden air is drawn up through chilled coils. This causes the "Freon" to condense out and return to the rinse pump. Reheating



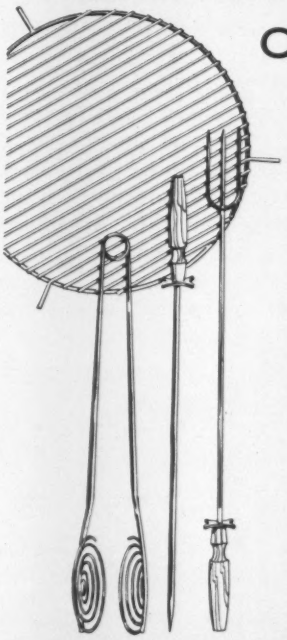
the circulating air restores its capacity to absorb solvent. This air is recycled at the discharge end, where it passes counter current to the moving parts and extracts the last trace of solvent from them. Thus, the parts are left completely dry at room temperature. (Auto-Sonics, Inc.)

For more data circle No. 56 on postcard, p. 129

Trims Pipe Lengths

Custom developed to cut off 11-ft lengths of nickel-chrome, cast-steel pipe, the initial machine in a series cuts size 10¾-in. OD x 9⅝-in. ID pipe in less than three minutes. Using a 16-in. abrasive wheel,

Example: FINER "TOOLS" FOR OUTDOOR LIVING



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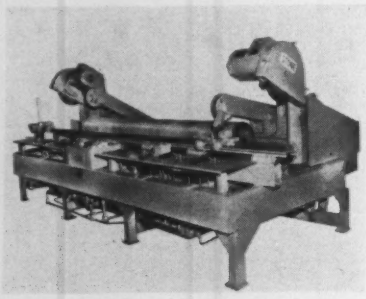
NEW EQUIPMENT

a precise square-end cut was produced with no change in the metal characteristics. The rotating, pipe-cutting unit has a full 10-hp, geared-in-head motor at each end. Stock



is held in position on opposing banks of self-centering support wheels, and by pressure rollers near each cutting head. (Stone Machinery Co., Inc.)

For more data circle No. 57 on postcard, p. 129

Stockroom Wizard

Will automation take over the stockroom? In at least one German warehouse it already has. Key to the programmed operation is a fork-lift truck that finds its own way. After the objective has been programmed at the central desk, the truck goes right to it. Then the fork lift places or removes the container from a pigeonhole, and the truck steers back to its starting point. The signals "put in" and

"remove" are pushbutton controlled. All operating processes take place automatically. No operating personnel are needed. However, the progress of the automatic stockroom service can be followed on a control panel fitted with pilot lights. (Demag Aktiengesellschaft)

For more data circle No. 58 on postcard, p. 129

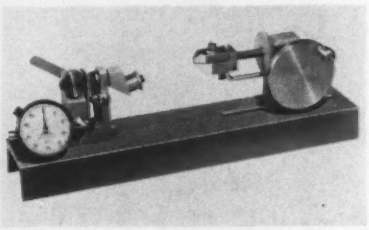
Production Sawing

For best results, team up the blade with the machine in production cut-off operations. Here's a production saw built to use the remarkable cutting ability of tungsten carbide. This means exceptional rigidity, a high-pressure cooling system and controlled speed and feed. When it's fitted with a new tungsten-carbide cutting blade, you have a combination that suits heavy-production work on a round the clock basis. Cutting speed is fast—up to 35 sq in. per minute in 1018 cold-rolled steel. (The DoALL Co.)

For more data circle No. 59 on postcard, p. 129

Tensile Tester

A new portable tensile tester boasts extremely light weight. It



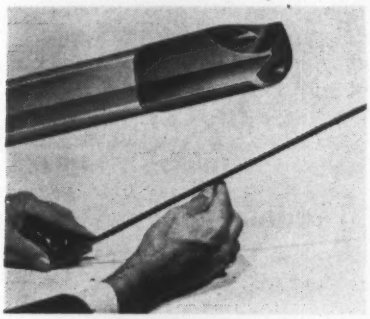
weighs only 6½ lb. However, it's available in 50- and 100-lb, load-capacity versions. Designed for field and sales work, the new machine provides accurate tensile - strength data for small-gage wire, spot-weld coupons, string and tensile materials. The indicator needle locks at peak load. Low cost is another attractive feature. (Detroit Testing Machine Co.)

For more data circle No. 60 on postcard, p. 129

Double-Jet Gun Drill

With two holes for cutting-fluid flow, instead of the normal single hole, a new single-flute carbide gun drill represents a basic change in drill design. Double-holes mean increased and properly-directed cutting-fluid flow to the tool's cutting

edges. This increases tool life between sharpenings up to three times. One hole effectively directs the fluid

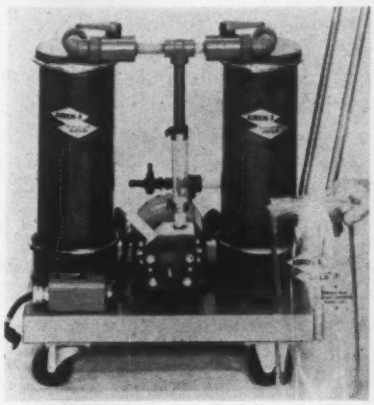


at the cutting edge. The other forces the chips back along the chip-space segment of the tool. In most materials, packing of chips along the shank of the tool is avoided. (Star Cutter Co.)

For more data circle No. 61 on postcard, p. 129

Reclaims Gold

This newly-developed, mechanical-chemical device reclaims gold from electroplating solutions and rinses. In addition, it's available with an integrated-refining service. In essence, the new equipment consists of a fluid-handling station utilizing twin-connected clear-lucite columns. These columns are charged with resins. Performance is impressive. The unit removes over 97 pct of the gold present in alkaline or acid solutions in one pass. According to company spokesman, the resins absorb trace amounts of gold that it was impractical to try for before, especially in cascade-rinse systems. Resin capacity is up to 30 troy oz. (The Precious Metals Recovery Corp., an affiliate of The Sel-Rex Corp.)



For more data circle No. 62 on postcard, p. 129

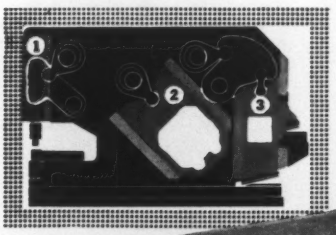
Large Stock Reels

Heavy-duty coil-stock reels, up to 2500-lb capacity, supply the stock to presses and accessory-feeding equipment in a smooth, even flow. The units are power driven and can be synchronized to other equipment by means of a mercury switch. They're equipped with electric, disk-type brakes that are long lasting and smooth acting. Coils automatically center and balance for easy unwinding. Keeper adjustments permit fast stock loading. The reels come in 3 sizes for 12-, 18- and 29-in. stock widths. (Cooper Weymouth, Inc.)

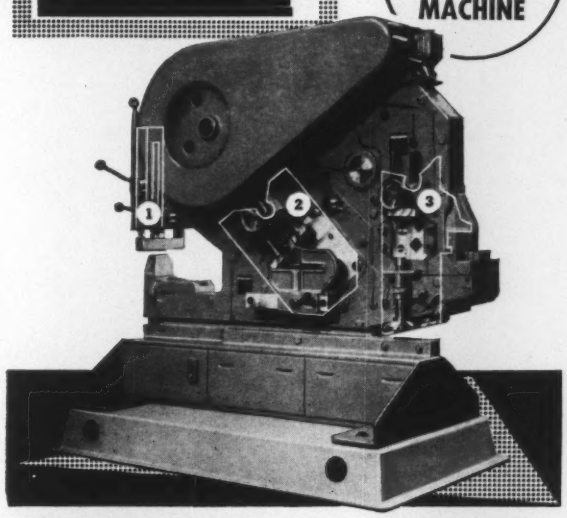
For more data circle No. 63 on postcard, p. 129

Versatile Microscope

Budget priced, yet high in quality, these metallurgical microscopes serve as teaching tools or produc-



3 CLUTCH MACHINE



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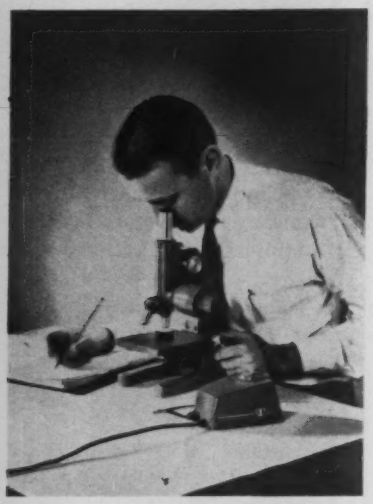


ments provide excellent viewing of opaque specimens. In addition, rigid castings assure almost complete freedom from the effects of severe vibration. Also, the simplified vertical illuminator works in either a bright field or in polarized light. (Bausch & Lomb Inc.)

For more data circle No. 64 on postcard, p. 129

Flexible-Shaft Machine

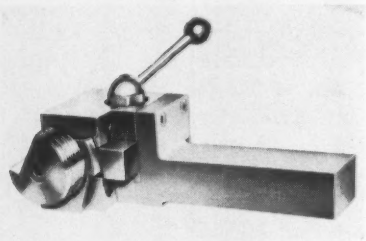
Here's a pedestal-mounted, flexible-shaft machine which operates at 1750 rpm. It's available with either 1/3- or ½-hp motor. One feature is a new handpiece that facilitates

attachment changes. Thus, the operator can quickly pull off one attachment and snap another on in a matter of seconds. Standard equipment is a 5- or 6-ft flexible tool shaft. Also featured is a bench-height pedestal, convenient for bench work, grinding, brushing or buffing. The machine's convenient tool tray keeps accessories off the floor. (Stow Mfg. Co.)

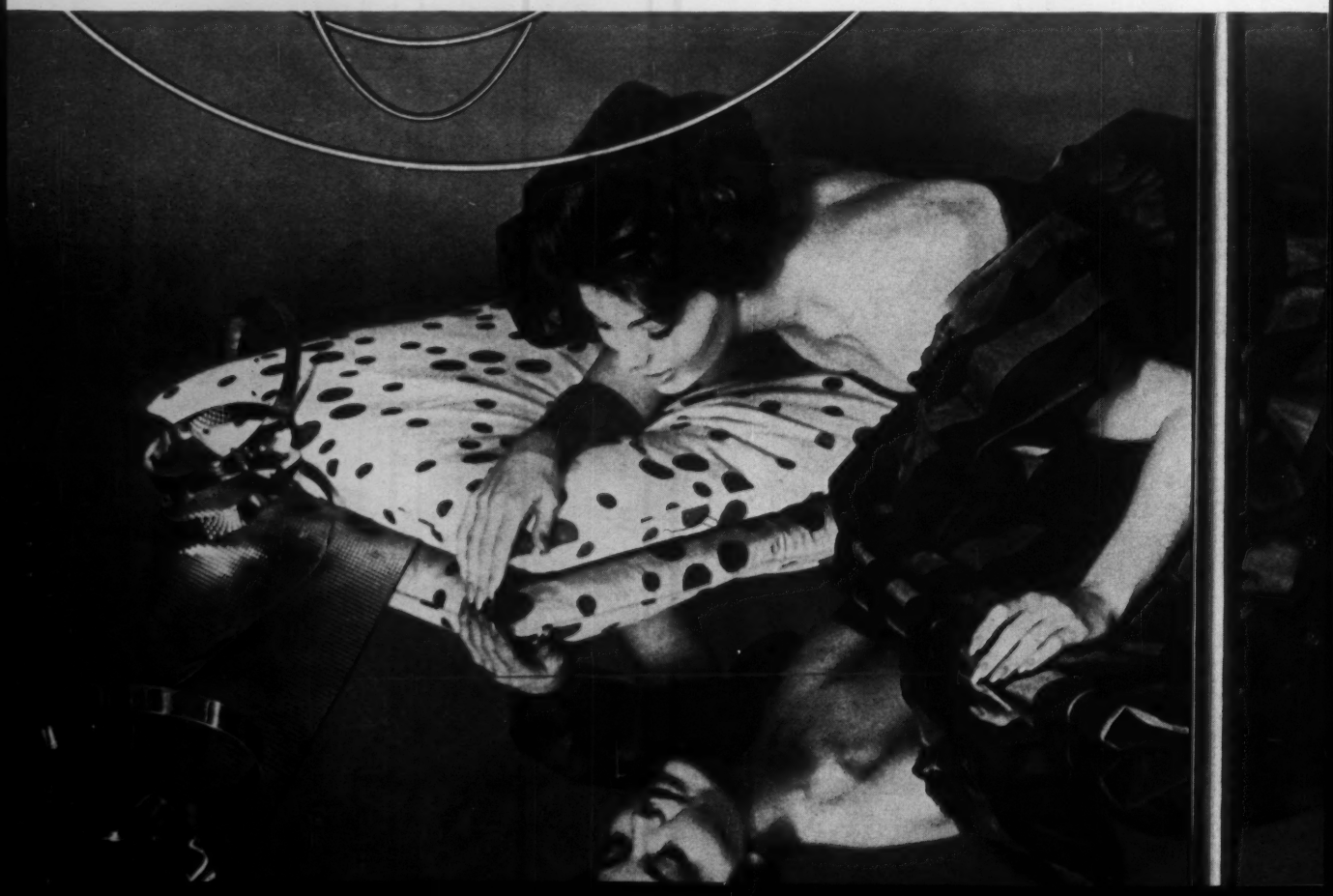
For more data circle No. 65 on postcard, p. 129

Threading Tool

Here's a versatile, single-chaser threading tool that backs off auto-



matically at the end of the cutting stroke. This boosts short-run threading efficiency. Since there's no return-cutting stroke at cutting depth,



you can forget about scrappage from damaged threads. Available in two sizes for fine and coarse threads, the tool suits any lathe equipped with a lead screw. And, it cuts tapers with any standard-taper attachment. (The National Acme Co.)

For more data circle No. 66 on postcard, p. 129

Flame Machine

Various standard "building-block" units assemble into a flame-heating machine that suits specific applications. To do this, a series of basket - type and conveyor - type quench tanks team up with standard flame-heating units. These heating units precisely control fuel gas, oxygen, air, water and primary electric power. In addition, there's a wide range of accessory equipment such as electronic temperature control and rotary flame heads, plus automatic work-handling fixtures. The self-contained quench tanks boast automatic circulation of the quench medium, a heat exchanger and a motorized conveyor. (Cincinnati Milling Machine Co.)

For more data circle No. 67 on postcard, p. 129

Machine Presets Tools

Cutting tool changes on automated machines usually mean costly idle time. It's hard to avoid. Setting the tools to the rigid accuracy required by numerically-controlled units just naturally takes time. But there's a way around the problem. It hinges on a new machine that presets the cutting tools to precise tolerances. It sets both diameters and depths for boring bars, milling cutters, drills and other accessory tooling. The newcomer mounts a presetting spindle on a rigid cast-iron base. This spindle has transverse- and longitudinal-slide adjustments. These slide elements have optical measuring instruments that read directly to 0.0001 in. without interpolation. One optical unit controls the diameter settings. The other sets length or depth. (De-Vlieg Machine Co.)

For more data circle No. 68 on postcard, p. 129

Automatic Flying Shear

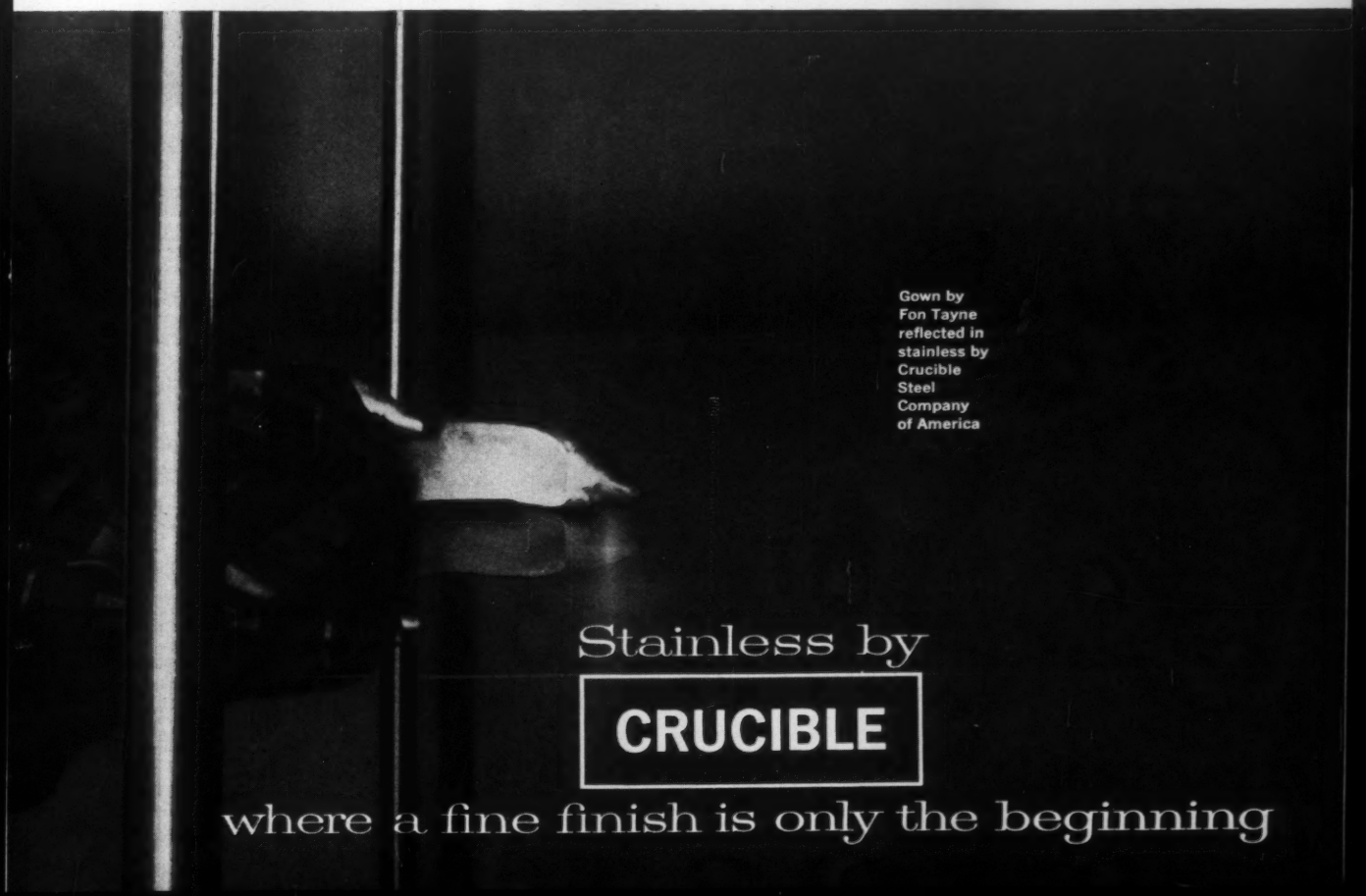
With a 200-ton capacity, this new standard flying-shear unit is the largest of its type ever built. It automatically cuts off tubing up to 6-in. OD with wall thicknesses ranging from 0.050-0.250 in. Maximum rate is 20 cuts per minute. Savings in scrap result from its ability to cut out short test samples and bad sections of tubing. (Alpha Press & Machine, Inc.)

For more data circle No. 69 on postcard, p. 129

Welding Positioner

The largest powered-elevation positioner available today boasts a full load of 120,000 lb. Fifty-four in. of geared elevation lifts the top load at 15 ipm to a full 90° tilt of the table. The geared-elevation principle relies on a 6-post elevator base. This base boasts 10-in. OD x 1-in. wall tubes with spur-rack teeth for the lift pinions. Each post has four guide rollers to establish rigidity during elevation.

For more data circle No. 70 on postcard, p. 129



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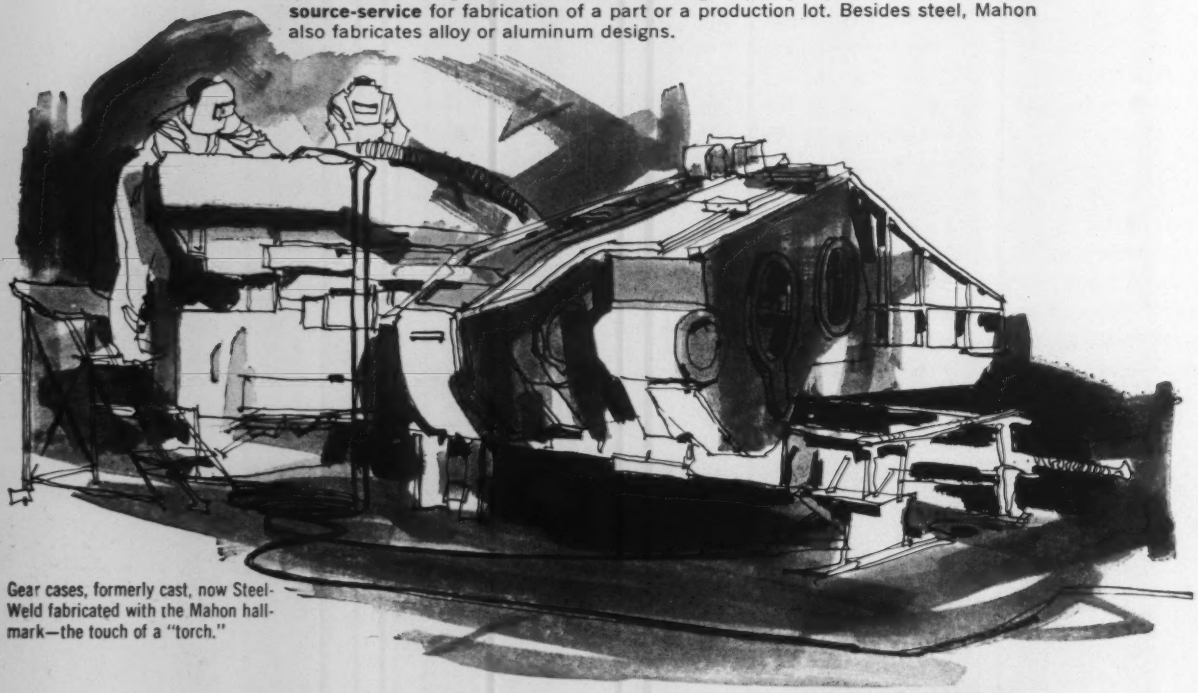

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MAHON

Automakers Shift Buying Plans

August shows a gain in spite of a change in buying by automakers. Big push not likely until September.

Pattern of orders varies widely among mills with August showing both gains and losses in orders.

■ A change in steel buying plans by automakers has cut into August orders. This has slowed the rate of improvement in August and has set back any sharp upturn in steel production into September.

The uncertainty in Detroit tends to overshadow a general strengthening of the market as orders for August come in. The month still looks better than July and may surpass June. The automakers have not dropped out of August by any means. But the rate of improvement now looks to be slower than was indicated two weeks ago.

Delivering Contrasts—As an illustration of this point, delivery promises in automotive centers have shortened while elsewhere around the country, some spot lengthenings are noted.

This means that some mills in the Midwest are producing more than they are shipping during the summer and have tonnages available for shipment from inventory. This is the result of two factors: Some steel producers fully intend to provide nearly immediate delivery after demand strengthens; and mills have kept production relatively level in spite of the summer order slowdown.

Automakers' Promises—Lack of progress in auto labor talks can not be discounted in affecting the steel buying plans of auto companies. There is no particular reason for stronger strike talk, but automakers are not building heavy inventories until the labor situation clarifies.

Another factor is that some automakers have overbought during the summer months. Whether intentional or not, one of the major companies apparently has a greater tonnage than usual going into the changeover period. Then too, changeover times vary considerably, making it more difficult to establish a uniform buying pattern for the late summer.

Mill Rundown—A cross-section of mill orders shows the mid-summer picture: One mill says July is running 8 percent under June and August is 10 percent ahead of July. This mill nevertheless holds August predictions down to a 5 pct gain.

Two other mills say advance orders indicate August will equal or better the June showing. One of these says September orders point to further improvement, although the tonnage involved is still too small for significance.

A major Midwestern mill says it expects to ship 10 pct less steel in August than July. This prediction is qualified by a possible change in favor of August, but the current rate of orders is below that for the May-June period.

This indicates the August-September pattern is far from stable and it could stay that way well into the month of August. Assurance of nearly immediate delivery of many products has kept many buyers from advance ordering.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	96	95	101	89
Buffalo	84	81	84	82
Pittsburgh	88	88	93	73
Youngstown	89	88	89	82
Cleveland	102	110	123	54
Detroit	117	120	134	117
Chicago	107	106	114	84
Cincinnati	117	112	118	70
St. Louis	107	104	120	52
Southern	103	112	117	94
Western	117	118	122	82
U. S. Index	99.7	99.8	106.2	81.6

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	1,858	1,860	50,568	64,615
Ingot Index				
(1957-59=100)	99.7	99.8	93.6	119.6
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$36.67	$36.67	$37.83	$31.50
No. 2 bundles	$24.17	$24.17	$24.83	$21.17

Value Analysis Grows at Mack

Mack Trucks, Inc. has just put a value analysis program into operation.

It's a company-wide project of purchasing. Value analysis engineers are at all branch plants, but under one manager.

■ There is no argument from top management or purchasing men on the cost reduction potential of value analysis. But there is great confusion, in many cases, on how to organize a program within the organization.

One leader in its field, Mack Trucks, Inc., has just gone through the throes of setting up a program. It got off the ground this spring. W. M. Williams, director of purchases, conceived the project and his division is directing it.

Last Frontier — "Management here realizes that purchasing is almost the last frontier for profits today," says Mr. Williams. "Purchasing is now considered a profit contributor, not just a clerical or paper handling function."

With this philosophy backing him up, Mr. Williams hired a specialist, Lee R. Morris, as manager of value engineering. And Mr. Morris is hiring other value engineers for each manufacturing plant.

Mack's purchasing staff is corporate, with line authority over purchasing activity in all plants. So the value analysis program will be a company-wide operation.

First Steps—Mr. Morris is using a three-fold approach in his program.

Through seminars, bulletins, and displays he is carrying out a buyers' training and educational program covering all purchasing departments. He has established a profit improvement program to record all cost savings on purchased materials, and to stimulate buyer activity. The third phase will see buyers working with the value engineer in their own plants, putting the value analysis text book techniques to work.

The training aspect has already begun. The program is aimed at getting top value through a variety of approaches, including: Analyzing value through function; evaluating by comparison; design reevaluation and modification; better manufacturing methods; standardization; substitution; better traffic operations; material handling and packaging improvements; and tighter inventory control.

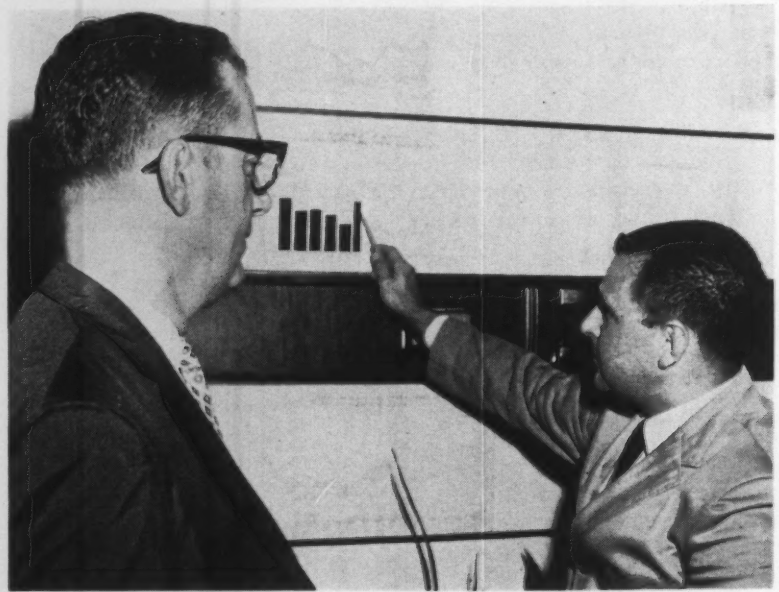
Buyers' Helpers—The value engineer at each purchasing location will provide additional training in value analysis. He will assist buying personnel in value analysis problems. And he will also pursue separate value engineering studies, generally related to major dollar volume purchased materials.

"We won't be doing someone else's job," Mr. Morris stresses. "Value analysis is not a substitute for engineering, manufacturing or cost reduction. It is a supplement. We are only concerned with getting top value for every purchasing dollar spent."

He points out that studies may cross into other departments for assistance, information or decisions. Special steps have been taken to assure that credit is given to all who contribute to the program.

Systematized Format—Mr. Morris has already set up procedures, systems, forms and methods as a framework for the program.

A catalog of projects is being developed for study. Project sources will include profit improvement proposals, major dollar volume commodities, research and engineering programs, self-initiated projects, and vendor suggestions.



CHARTING COURSE: W. M. Williams (left), director of purchases, studies Mack VA plans with Lee R. Morris, manager of value engineering.

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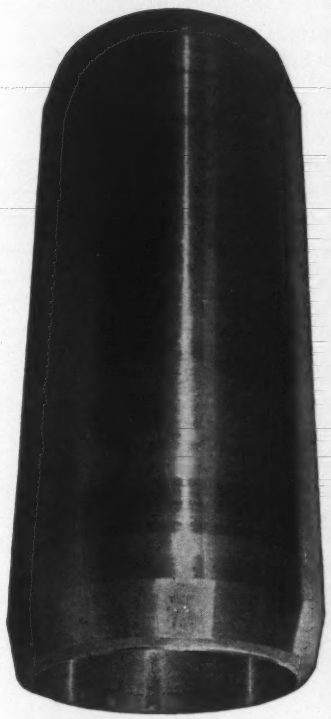

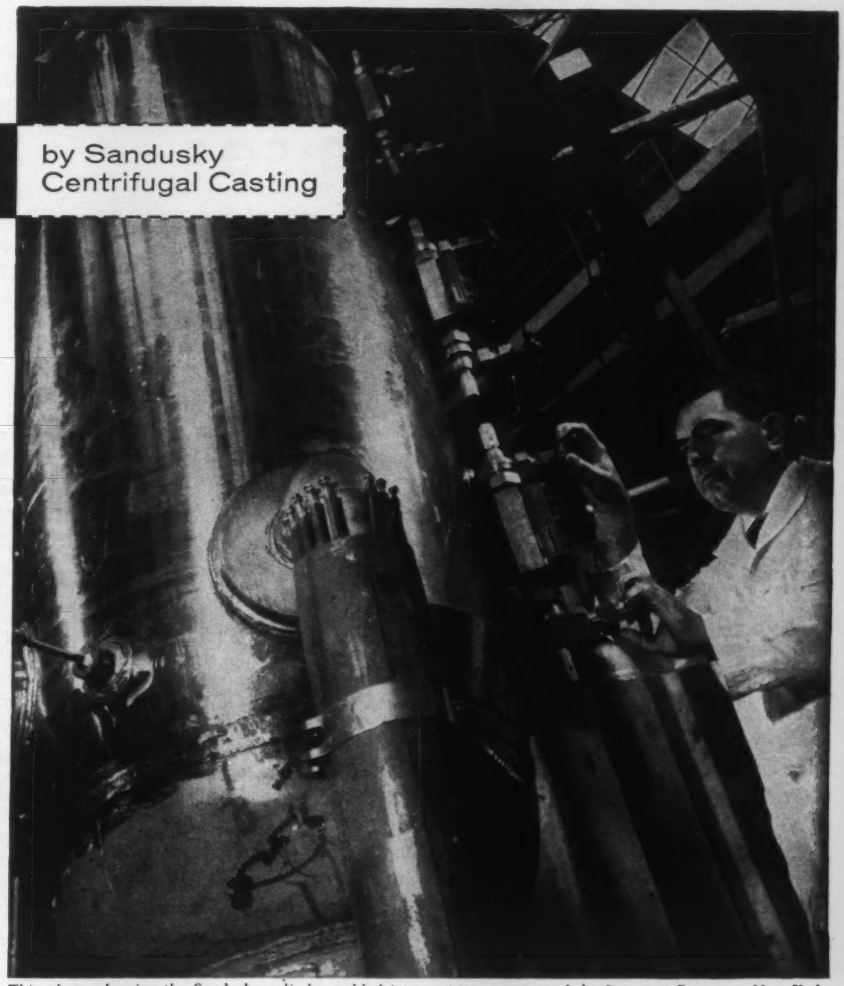

This photo, showing the Sandusky cylinder welded into position, courtesy of the Lummus Company, New York. New York who fabricated, assembled and tested the completed loop before shipping it to the ETR site in Idaho.

Nuclear Test Loop Uses Sandusky Centrifugal Casting as Pressurizer Cylinder

A Sandusky Centrifugal Casting is the main cylindrical component of an electrically heated pressurizer, designed by Knolls Atomic Power Laboratory to Section VIII, of the ASME Code (Unfired Pressure Vessels) for use in the new Engineering Test Reactor facilities at Idaho Falls, Idaho.

This 66¼" long cylinder, 27" O.D. with walls 2½" thick, was centrifugally cast of an 18-8 stainless steel (SA-351, Grade CF-8) for the extra corrosion resistance required under nuclear loop service conditions: demineralized water at temperatures to 650°F and pressures to 2500 PSI.

O. G. Kelley Co., Boston, to whom we delivered this 2-ton, fully machined cylinder, welded on the forged heads and nozzles, radiographed the welds, and hydro tested the completed vessel to 4300 PSI.

This is another example of the adaptability of Sandusky Centrifugal Castings to applications demanding the highest order of quality. They may well offer you a practical and economical answer to your cylindrical needs, also.

We are producing cylinders and piping in diameters from 7" to 54"—in lengths to 33 ft.—in a wide range of ferrous and non-ferrous alloys. Write for Bulletin 300, for more complete technical information on the Sandusky process and product application data.

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Delivery Promises Start Moving Out

In some markets sheet, strip, plate, and hot-rolled bar delivery estimates have stretched out a week or more.

It's too early to tell how far the trend will go. What happens to auto steel orders will be important.

■ Mill delivery promises have started to stretch out a little. As yet it's hard to tell if the trend will continue. Much depends on the automotive labor outlook. If auto talks end without a strike, automakers will come into the steel market heavily next month.

This will put greater pressure on deliveries, especially sheet, strip and bar products. The impact could keep deliveries moving out.

Mills Getting Ready—Shipments to other steel users have slowed this month, but will rebound in August and beyond. To get ready for this, some mills are building up stocks now. In this way they hope to keep deliveries rapid when demand increases in the fall. One producer is keeping some mills running at nearly full capacity although the rate of incoming orders only demands 60 pct operations.

"Our delivery schedule is more flexible now than it was in May and June," says another mill man, "except for galvanized which is filled well into September."

Aside from galvanized, the delivery pushouts this month are in sheet, strip, plate and bar products. Most of these products are out a week or two in most major markets. The exceptions are Pittsburgh and Chicago where deliveries are unchanged. At Detroit, mill delivery estimates on sheet and strip actually dropped a week.

Galvanized Sheet — Continued strong demand for galvanized is certain. Many mills are already booked into late September or early October. Farm, residential, and commercial construction are at their seasonal peak. **Cleveland** area mills report the demand from rural and construction markets comes on top of increased galvanized use in autos. The bulk of the demand is for sheet in widths under 50 in. One warehouse had a shipment of 700 tons from its mill bought out in a matter of hours by builders.

Tinplate—Shipments to users are called "very satisfactory," by one **Pittsburgh** mill. This producer says mill inventories are no larger than normal at this time of year. Another mill says August demand from buyers is about on a par with July.

Reinforcing Bars—Major mills suspended list prices for this product in mid-June. They are now negotiating prices with buyers as orders or inquiries are received. **East Coast** fabricators report most mills are willing to negotiate, although until recently some were sticking to last published prices. Pricing is chaotic with some small producers quoting bar at $5 to $12 a ton under major domestic mills. Foreign mill prices are even lower than that.

At **Pittsburgh** some rebar users say mill prices are running about 5.25¢ a lb. This compares with the last published base price of 5.675¢ a lb. Prices are being negotiated and quotes as low at 5¢ a lb are possible for large quantities. There has been no change in extras, one source reports.

Plates—Users are still able to get rapid delivery on most plate products. Despite a slight stretchout in mill deliveries at **East Coast, Cleveland,** and **West Coast** mills, buyers are still searching around for the best possible delivery. In some cases, it's vital because they need the plate for immediate production or construction use. Mills are looking beyond a fair August and September to an expected strong fourth quarter.

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	3–5 wks	3–5 wks	3–5 wks	3–5 wks	3–4 wks	6 wks
HR Carbon Sheet	2–5 wks	3–4 wks	2–4 wks	2–4 wks	2–3 wks	6 wks
CR Carbon Strip	3–5 wks	4–5 wks	3–5 wks	3–5 wks	3–4 wks	4 wks
HR Carbon Strip	2–5 wks	3–4 wks	2–4 wks	2–4 wks	2–3 wks	5 wks
HR Carbon Bars	2–4 wks	2–3 wks	2–4 wks	1–6 wks	1–3 wks	4–5 wks
CF Carbon Bars	2–4 wks	2–3 wks	Stock–4 wks	Stock–5 wks	2–3 wks	1–2 wks
Heavy Plate	3 wks	2–3 wks			1–2 wks	7–8 wks
Light Plate	3 wks	1–2 wks	1–3 wks		1–2 wks	6–7 wks
Merchant Wire	Stock	Stock	Stock		3–4 wks	Stock
Oil Country Goods	Stock	Stock	Stock		Stock–2 wks	
Linepipe	Stock	1–4 wks	Stock		1–3 wks	Stock
Buttweld Pipe	Stock	Stock	Stock	Stock	1–2 wks	Stock
Structurals	2–4 wks	1–2 wks	1–4 wks	1–4 wks	2–4 wks	Stock–4 wks
CR Stainless Sheet	Stock–4 wks	Stock–3 wks	Stock–3 wks	Stock–5 wks		
CR Stainless Strip	Stock–4 wks	Stock–3 wks	Stock–3 wks	Stock–5 wks		

COMPARISON OF PRICES

(Effective July 24, 1961)

Steel prices on this page are the averages of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	July 24 1961	July 17 1961	June 20 1961	July 19 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes.	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	July 24 1961	July 17 1961	June 20 1961	July 19 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. cent per lb.‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig Iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$35.50	$35.50	$36.50	$30.50
No. 1 steel, Phila. area	38.50	38.50	39.50	33.50
No. 1 steel, Chicago	36.00	36.00	37.50	30.50
No. 1 bundles, Detroit	35.50	35.50	35.50	27.50
Low phos., Youngstown	40.50	40.50	40.50	34.50
No. 1 mach'y cast, Pittsburgh	45.50	45.50	45.50	48.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	49.50
No. 1 mach'y cast, Chicago	47.50*	49.50	49.50	45.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$36.67	$36.67	$37.83	$31.50
No. 2 bundles	24.17	24.17	24.83	21.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$31.00	$31.00	$31.00	$33.00
Copper, Lake, Conn.	31.00	31.00	31.00	33.00
Tin, Straits, N. Y.	115.50†	115.25*	112.50	103.50
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strip.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Market Probably Faces a Test

Auto and other industrial lists for August could provide a real test for the market. Most lists will be out this week.

Generally, the market is still in its seasonal lull. But dealers remain optimistic.

■ Scrap prices, which have remained relatively stable in recent weeks, will be tested this week.

Auto lists will provide a test of the market in several key areas including Pittsburgh and Cleveland. Interest in Chicago centers on the August industrial lists which start closing this week. There is also some feeling that industrial prices on No. 1 grades in Detroit may rise somewhat.

A significant development in the market this week is the failure of Cincinnati scrapmen to get reduced barge rates. They had hoped for a reduced rate for shipments to the Gulf coast. This would have increased export shipments out of that area. But the rate of about $10 is holding.

The national market generally continues in its seasonal lull. Scrapmen still look for gains by August or September.

The IRON AGE composite price for No. 1 heavy melting scrap remains unchanged again this week at $36.67. The composite price for No. 2 bundles is still $24.17.

Pittsburgh — Market lull continues. One local buyer dropped his price for No. 2 bundles by $1. There is no change in the price quoted dealers for shipment to a mill outside the district. Auto lists will test the market this week. The tonnage being offered for August is up about 50 pct over July. Brokers feel there will be enough demand to absorb the larger offerings and hold prices firm. They admit, however, the current pattern of minor price fluctuation gives little incentive for protective or speculative bidding.

Chicago—Interest centers on August industrial lists which start closing this week. About the same tonnage is up for sale—perhaps a little more. Many observers see a bit more strength, but probably not enough to advance prices. Mills, which haven't been buying too heavily, should come in for some August buys. Exports are still a factor as old orders continue to be filled. Indications are that there has been a general leveling off in the cast market in recent days.

Philadelphia—The market is still the same. Scrapmen in the area say this market is no weaker. They say it's just a matter of time before additional strength appears. Exporting is still active. Two ships left the port recently and another is being loaded now. Dealers say yards are being kept busy. A local buy of railroad specialties was made this week at $1 above the quoted price.

New York—There is no change in the market this week. Dealers continue to keep reasonably busy loading ships. Domestic business for steelmaking grades is still almost non-existent. Dealers see nothing in the next few weeks to change the pattern.

Detroit—August industrial lists close this week. There is some feeling that industrial prices on No. 1 grades may rise somewhat. Tonnage offered is less than one month ago. But interest seems sustained. Domestic mills will take some scrap.

Cleveland — Tonnage on auto lists is sharply down this week because of model changeovers. This should provide a good test of the market strength. Otherwise, the market continues slow with spot sales of small tonnage.

Cincinnati—There will be little export of scrap from Cincinnati and other Upper Ohio points since present barge rates of about $10 will stay in effect. Local shippers had sought a rate cut to New Orleans. But it's been turned down. Thus, there's little chance of competing.

St. Louis—Some buying interest is being shown. In fact, $1 gains are noted on some grades. Dealers feel the market is as low as it will go. No downward pressures are evident and no one seems anxious to sell.

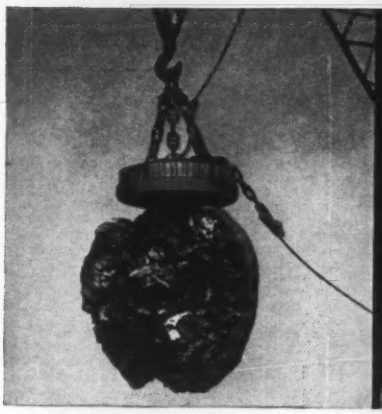
Birmingham—Scrap orders were more numerous this week, but total tonnage was small. The majority of purchases were limited. Consumers appear to be shopping around in a test of the market. No one is really certain which way the market will go at this point.

Buffalo—The market continues very quiet with activity virtually nonexistent. Dealers are hopeful of an upturn next month.

Boston—It's been another extremely quiet week for the scrap market in this area. There is very little doing domestically. And export interest is missing.

West Coast—Exporting is on the quiet side. There's talk in the trade that the domestic mills will come into the market in August. If they do, they'll take up the current slack. Prices are firm.

Houston—Market is quiet. And indications are that it will remain this way through August. There are a few export orders.



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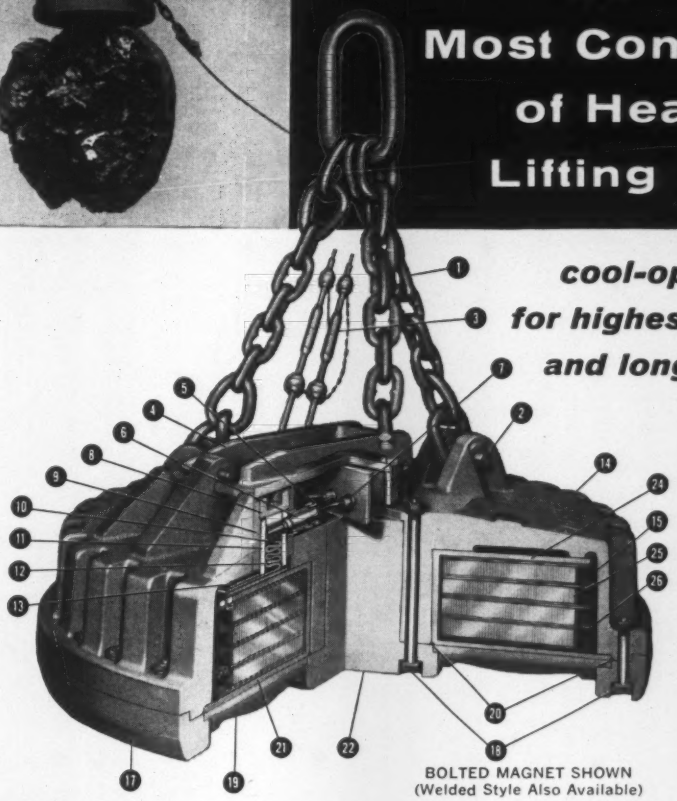

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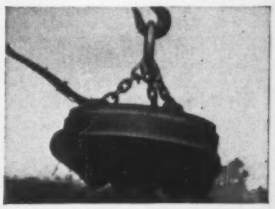

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SCRAP PRICES *(Effective July 24, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	43.00 to 44.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. punch'gs plate	43.00 to 44.00
Heavy turnings	30.00 to 31.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	85.00 to 90.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$35.00 to $37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.50 to 37.50
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	44.00 to 45.00
Low phos. punch'gs plate, ¾ in. and heavier	44.00 to 45.00
Low phos. 2 ft and under	41.00 to 42.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	46.00 to 47.00
Rerolling rails	58.00 to 60.00
Rails 2 ft and under	48.00 to 49.00
Angles and splice bars	44.00 to 45.00
RR steel car axles	58.00 to 59.00
RR couplers and knuckles	43.00 to 44.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	42.00 to 43.00
Cast iron wheels	34.00 to 35.00
Malleable	46.00 to 47.00
Stove plate	36.00 to 38.00
Steel car wheels	42.00 to 43.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	105.00 to 110.00
430 bundles and solids	90.00 to 95.00
430 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	29.00 to 30.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft punch'gs	44.00 to 45.00
Elec. furnace bundles	43.00 to 44.00
Heavy turnings	27.00 to 28.00
RR specialties	43.00 to 44.00
Rails, 18 in. and under	52.00 to 54.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	40.50 to 41.50
Malleable	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	39.00 to 40.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast.	33.00 to 34.00
Heavy breakable cast.	30.00 to 31.00
Drop broken cast.	44.00 to 45.00

Youngstown

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Low phos. plate	40.00 to 41.00

Cleveland

No. 1 hvy. melting	$34.50 to $35.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	34.50 to 35.50
No. 1 factory bundles	41.50 to 42.50
No. 2 bundles	22.50 to 23.50
No. 1 busheling	34.50 to 35.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft & under	39.50 to 40.50
Low phos. punch'gs plate	35.50 to 36.50
Drop forge flashings	34.50 to 35.50
Foundry steel, 2 ft & under	34.00 to 35.00
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	52.00 to 53.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	48.00 to 49.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	39.00 to 40.00
Malleable	51.00 to 52.00
Stainless	
18-8 bundles	170.00 to 175.00
18-8 turnings	100.00 to 105.00
430 bundles	70.00 to 75.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed. bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Scrap rails, random lgth.	38.00 to 39.00
Rails 2 ft and under	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
Foundry steel, 2 ft	31.00 to 32.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.50 to 14.50
Shoveling turnings	15.50 to 16.50
Cast iron borings	21.00 to 22.00
No. 1 RR hvy. meltings	36.00 to 37.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	44.00 to 45.00
RR specialties	40.00 to 41.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	55.00 to 56.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	43.50 to 44.50
Structural and plate, 2 ft.	42.50 to 43.50
No. 1 RR hvy. melting	38.00 to 39.00
Scrap rail, random lgth.	41.00 to 42.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	42.00 to 43.00
Stove plate	42.00 to 43.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	18.00 to 19.00
Machine shop turnings	5.00 to 6.00
Mixed bor. and turn.	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	32.00 to 33.00
Drop forge flashings	32.00 to 33.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	13.00 to 14.00
Heavy breakable cast.	28.00 to 29.00
Mixed cupola cast.	30.00 to 31.00
Automotive cast.	39.00 to 40.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	70.00 to 75.00
430 bundles and solids	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	4.00 to 4.50
Shoveling turnings	8.00 to 8.50
Clean cast. chem. borings	17.50 to 18.00
No. 1 machinery cast.	39.00 to 40.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	29.00 to 29.50

San Francisco

No. 1 hvy. melting	$41.00
No. 2 hvy. melting	38.00
No. 1 dealer bundles	28.00
No. 2 bundles	27.00
Machine shop turn.	$16.00 to 17.00
Cast iron borings	16.00 to 17.00
No. 1 cupola cast.	45.00 to 46.00

Los Angeles

No. 1 hvy. melting	$40.00
No. 2 hvy. melting	37.00
No. 1 dealer bundles	28.00
No. 2 bundles	25.00
Machine shop turn.	15.00
Shoveling turnings	15.00
Cast iron borings	15.00
Elec. furnace 1 ft and under (foundry)	50.00
No. 1 cupola cast.	46.00

Seattle

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 2 bundles	$25.00 to 26.00
No. 1 cupola cast.	36.00
Mixed yard cast.	31.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

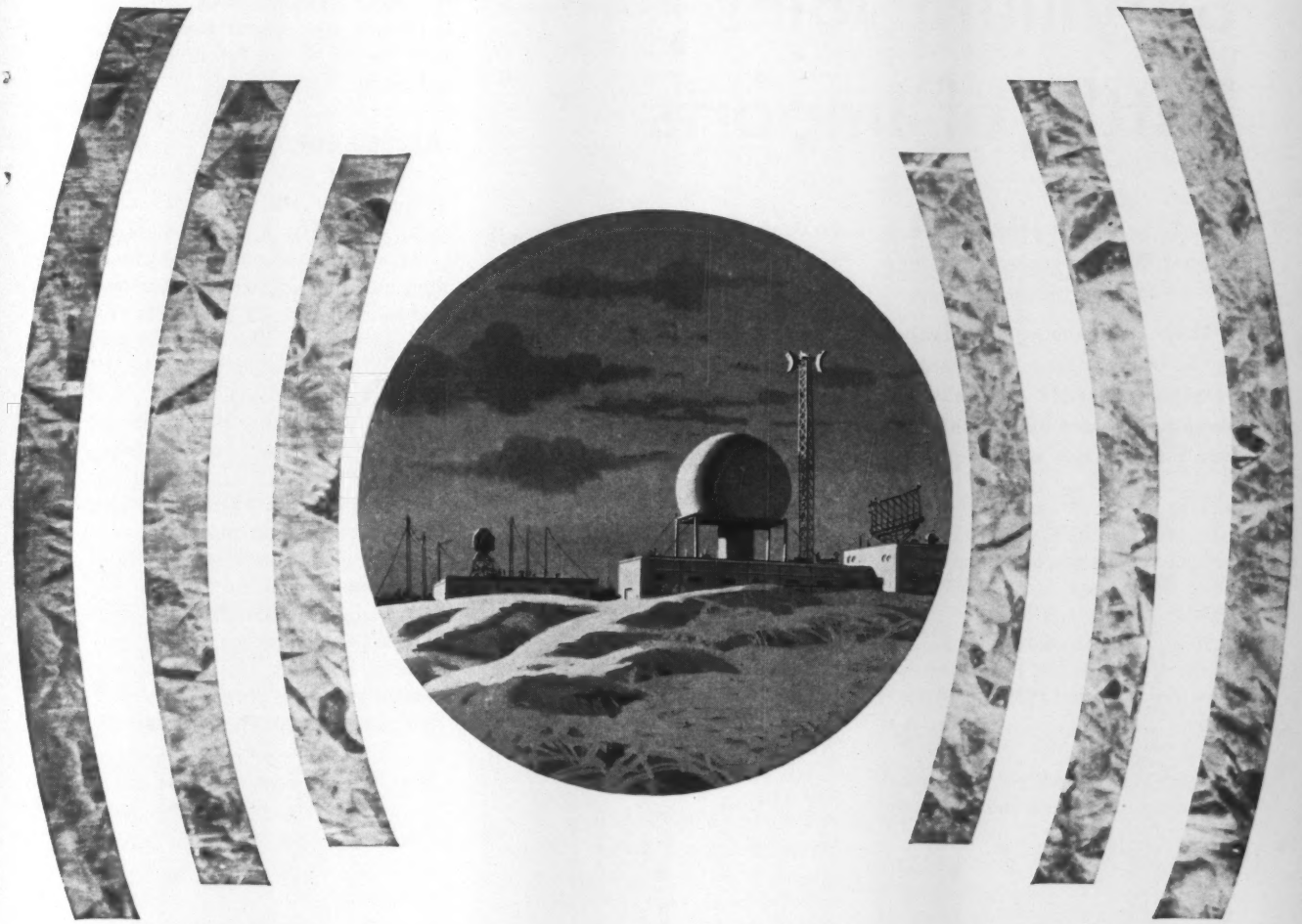
No. 1 hvy. melting	$31.00
No. 2 hvy. melting cut 3 ft and under	28.00
No. 1 dealer bundles	31.00
No. 2 bundles	23.50
Mixed steel scrap	23.00
Bush., new fact., prep'd.	31.00
Bush., new fact., unprep'd.	25.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	29.00
No. 2 bundles	22.00
Machine shop turn.	8.00
Shoveling turnings	11.00
Cut structural plate 2 ft & under	$44.00 to 45.00
Unstripped motor blocks	29.00 to 30.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	29.00 to 30.00

U.S. Air Force DEW-Line buildings fend off corrosion . . .



GUARDED BY GALVANIZED STEEL

Galvanized steel sheets—over 300 tons—will fill a vital need in the construction of unique air terminal/storage buildings for our Air Force's DEW (Distant Early Warning) Line.

The need? Maximum strength plus a defense against the DEW Line's dew point. Based north of the Arctic Circle, these buildings and their interior warmth will abut against bitter outside cold to create a temperature differential up to 130°—and a condensation-corrosion threat as extreme as the −60° surroundings. To eliminate the threat, each building will consist of: insulated galvanized steel floor construction, galvanized steel for outer skin of sidewalls, galvanized steel for inside (vapor barrier) face of sidewalls.

WEIRKOTE® IN PARTICULAR! To the inherent strength, economy and versatility of steel, Weirkote adds enduring zinc protection via the modern continuous process. As a result, Weirkote galvanized steel can be worked to the very limits of the steel base without chipping or peeling. And it assures you of long-lasting protection against corrosion. It is manufactured by two National Steel divisions, Weirton Steel and Midwest Steel. Write Weirton Steel Company, Weirton, West Virginia, for further details.

MIDWEST STEEL
Portage, Indiana

WEIRTON STEEL
Weirton, West Virginia

divisions of
NATIONAL STEEL CORPORATION

Beryllium Joins Battle of Imports

U. S. beryllium producers are using different processes to turn out oxide from domestic ore.

They are aiming at ending U. S. dependence on foreign beryllium sources. But government policy and long contracts won't bring this about quickly.

▪ This week in Salt Lake City, Governor George Clyde of Utah was presented with pieces of ore, beryllium oxide and beryllium metal, labeled:

"To Commemorate the Freeing of the United States From Dependence on Imported Ore for Production of Beryllium—The Space Age Metal."

The presentation was by United Technical Industries and Beryllium Corp.

Vincent A. Duff, president, reports United Technical is producing a 97 pct beryllium oxide from its low grade ore at Spors-Topaz Mountain in southwest Utah.

Production Jump — Within 45 days, the plant will reach a full production rate of 30,000 lb per month. Within a year, this will expand by about 700 pct.

At that time, he expects the operation to fill all of the needs of Beryllium Corp., its partner in the venture.

Price Drop—Domestic ores run about 1 pct beryllium. Foreign ores are between 8 and 14 pct. Mr. Duff says beryllium oxide is competitive now. And it will probably be lower than the import price when the expanded plant goes on stream.

Another company working in this direction, with a different process, is Beryllium Resources, Inc. It is operating in partnership with Brush Beryllium Corp.

Beryllium Resources and United Technical are the only beryllium-producing companies in the U. S.

Independent Case — Mr. Duff makes a good case for the complete independence of the U. S. for sources of beryllium. But many observers say this will be more theory than fact, barring unusual developments.

Since 90 pct of the ore from which beryllium is derived has long been imported, there are long term contracts. These were made to insure steady sources of supply. They won't be dispensed with in one year.

Brazil is a major source of supply. Government policy will probably dictate that Brazilian ores continue to be encouraged in the U. S. And since the government accounts for about 80 pct of beryllium made in the U. S. it is in a position to back up its demands.

No Market—According to current arrangements, there just wouldn't be a market for any other oxide or concentrate than that turned out by Beryllium Resources or United Technical.

Tin

A company seeking 500 tons of tin or less, intending to use it in the U. S., can submit a sealed bid to the General Services Administration.

Generally of good quality, it is Longhorn tin from the Texas City Smelter. It has been between production and the stockpile for several years.

With the market tight, GSA agreed to sell 500 tons. Total is slightly under 4000 tons. The sale may take a while. GSA must see if several government departments have use for the tin before it can be put on the market.

Aluminum

Outboard motors will take 50 million lb of aluminum this year, says Aluminum Co. of America.

Aluminum accounts for more than half the weight of the average motor, and over 75 pct of its volume, says Alcoa. The company predicts this application will take 85 million lb by 1965.

There will be 500,000 motor units built this year, but only 300,000 new boat starts. Reason for this, according to Alcoa: It's easier to rent boats than motors.

Over half of the 50 million lbs of aluminum used in motors this year will go into outboard engine castings. The remainder is for propellers, housings, forged transom clamps and other small parts. Decorative sheet is another growing use.

Tin Prices for the Week

July 18 — 115.25; July 19 — 115.25; July 20—115.625; July 21 —115.625; July 24—115.50*.

* Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum ingot	26.00	24.70	12/17/59
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	81.25	74.00	6/30/61
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 153.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	147	126	145
Strip, CR	133	114	145
Rod, bar, HR	116	95	116
Angles, HR	116	95	116
Plates, HR	139	116	133
Shot, blocks	...	93	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	52.15	52.44	52.09	56.21
Brass, Red	53.17	53.46	53.11	57.23
Brass, Naval	53.94	60.25	47.75	58.10
Muntz Metal	51.94	.....	47.25	.....
Comm. Bz.	54.73	55.02	54.67	58.34
Mang. Bz.	57.71	61.54	51.27	.....
Phos. Bz. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod 34.77

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $5.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismouth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base .... $ 1.31
Cobalt, 97-99% (per lb) .. $1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. .... $75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury dollars per 76-lb flask f.o.b. New York ..... $193 to $197
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 77.50
Palladium, dollars per troy oz.. $24 to $26
Platinum, dollars per troy oz.. $82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 32.00
- No. 120 ..... 31.25
- No. 123 ..... 30.50

80-10-10 ingot
- No. 305 ..... 36.00
- No. 315 ..... 33.75

88-10-2 ingot
- No. 210 ..... 43.75
- No. 215 ..... 40.50
- No. 245 ..... 35.75

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 420 ..... 30.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 23.75-24.25
- 0.60 copper max. 23.50-24.00

Piston alloys (No. 132 type) .. 25.00-26.00
No. 12 alum. (No. 2 grade) ... 21.75-22.25
108 alloy 22.25-22.75
195 alloy 24.75-25.75
13 alloy (0.60 copper max.) 23.50-24.00
AXS-679 (1 pct zinc) 22.00-23.00

(Effective July 24, 1961)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 23.25-24.25
Grade 2—92-95% 22.00-23.00
Grade 3—90-92% 21.00-22.00
Grade 4—85-90% 20.00-21.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	26⅛
Yellow brass	20⅝	18½
Red brass	23⅞	23⅛
Comm. bronze	24¾	24
Mang. bronze	19¼	18⅛
Free cutting rod ends	19½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 28
- No. 2 copper wire 26½
- Light copper 24¼
- *Refining brass 25⅛
- Copper bearing material 24¼

*Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 28
- No. 2 copper wire 26½
- Light copper 24¼
- No. 1 composition 23
- No. 1 comp. turnings 22½
- Hvy yellow brass solids 18
- Brass pipe 16½
- Radiators 19

Aluminum

- Mixed old cast. ..... 12½—13
- Mixed new clips ..... 14½—15
- Mixed turnings, dry ..... 13½—14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 24¼—24¾
- No. 2 copper wire ..... 22¼—22¾
- Light copper ..... 20 —20½
- Auto radiators (unsweated). 16 —16½
- No. 1 composition ..... 20½—21
- No. 1 composition turnings.. 20 —20½
- Cocks and faucets ..... 16½—17
- Clean heavy yellow brass ... 14¼—14¾
- Brass pipe ..... 16½—17
- New soft brass clippings .... 18½—19
- No. 1 brass rod turnings .... 16½—17

Aluminum

- Alum. pistons and struts .... 7 — 7½
- Aluminum crankcase ..... 9½—10
- 1100 (2s) aluminum clippings 12¼—12¾
- Old sheet and utensils ..... 9½—10
- Borings and turnings ..... 4½— 5
- Industrial castings ..... 10 —10½
- 2020 (24s) clippings ..... 11 —11½

Zinc

- New zinc clippings ..... 5 — 5¼
- Old zinc ..... 3 — 3¼
- Zinc routings ..... 1¾— 2
- Old die cast scrap ..... 1¾— 2

Nickel and Monel

- Pure nickel clippings ..... 56 —58
- Clean nickel turnings 43
- Nickel anodes ..... 56 —58
- Nickel rod ends ..... 56 —58
- New Monel clippings ..... 26 —26½
- Clean Monel turnings ..... 18½—19
- Old sheet Monel ..... 25 —25½
- Nickel silver clippings, mixed. 20
- Nickel silver turnings, mixed. 17

Lead

- Soft scrap lead ..... 7¼— 7½
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous

- Block tin ..... 90 —92
- No. 1 pewter ..... 65 —67
- Auto babbitt ..... 46 —47
- Mixed common babbitt ..... 10 —10½
- Solder joints ..... 15 —15½
- Small foundry type ..... 9 — 9½
- Monotype ..... 9¼— 9¾
- Lino. and stereotype ..... 8½— 8¾
- Electrotype ..... 8 — 8¼
- Hand picked type shells .... 5¾— 6¼
- Lino. and stereo. dross .... 1¾— 2¼
- Electro dross ..... 2½— 3

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, City, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective July 24, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Cokes▲ *1.25*-lb. base box	Electro▲▲ *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. ▲ COKES: 1.50-lb. add 25¢. ▲▲ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*					7.575 *U1*	9.325 *U1*			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*					
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *U1, W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3* 10.125 *U1, J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

Hollowware Enameling
29 ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective July 24, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries.		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*		7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective July 24, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	9.60	10.16	10.16	11.35	9.70	9.95	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.59	9.45	8.41	8.47	8.26	13.14	18.84	16.65	22.94	22.19
Boston**	.10	10.00	10.50	11.62	12.50	9.95	10.60	10.15	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.85	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.90	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.48	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	11.20	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	7.91	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	12.15	12.10	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.78	10.50	10.95	11.44	9.47	9.82	9.67	12.85	18.59	16.68	22.69	21.04
Milwaukee**	.15	9.51	10.49	10.99	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.34	20.59
New York**	.10	10.17	10.88	11.45	12.47	10.32	11.00	10.54	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.60	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.68	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		10.40	12.25	12.35	12.40	10.55	11.00	10.40	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.95	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.73	11.23	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	9.72	10.39	11.54	11.89	9.56	10.07	9.72	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1": Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅛" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13c zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier: [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective July 24, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	Pct
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	Pct
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)	
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7,* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G3;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

F.o.b. mill.

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective July 24, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	...	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.80
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2**	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	...	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

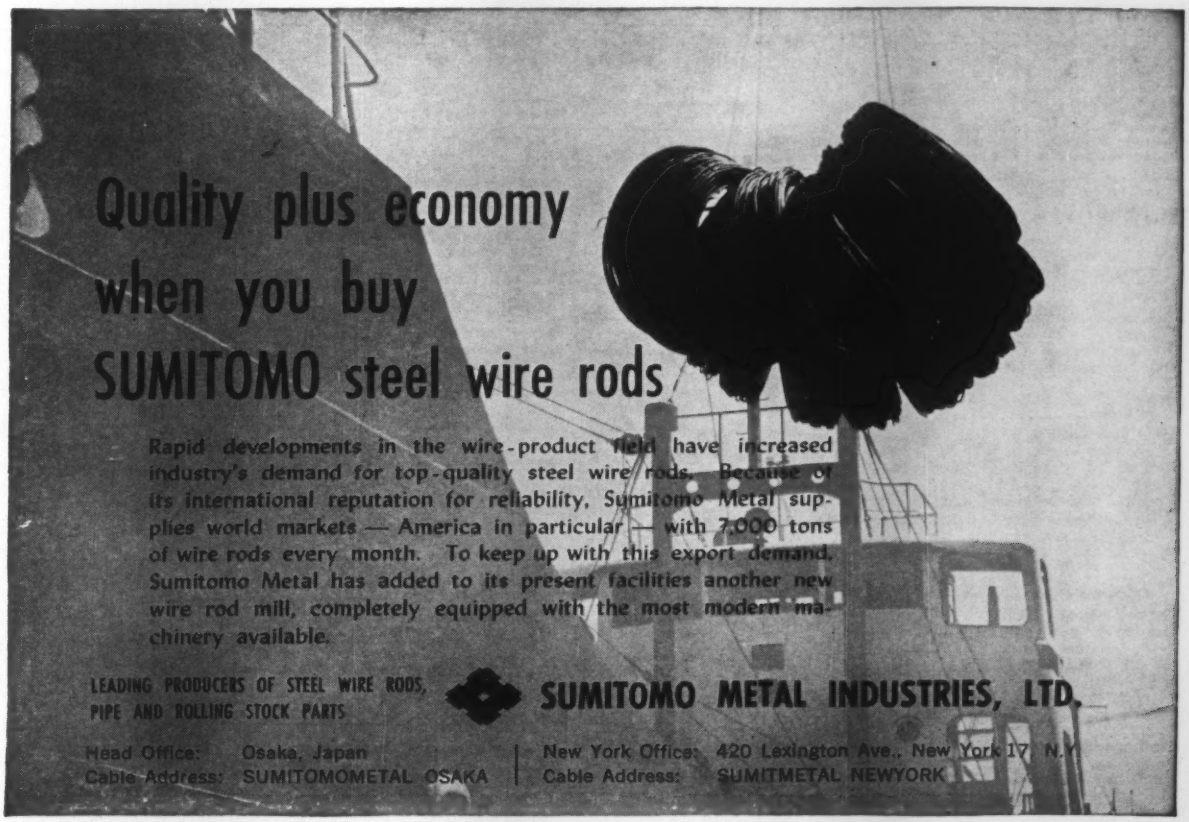
CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75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Rapid developments in the wire-product field have increased industry's demand for top-quality steel wire rods. Because of its international reputation for reliability, Sumitomo Metal supplies world markets — America in particular — with 7,000 tons of wire rods every month. To keep up with this export demand, Sumitomo Metal has added to its present facilities another new wire rod mill, completely equipped with the most modern machinery available.
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Cable Address: SUMITOMOMETAL OSAKA
New York Office: 420 Lexington Ave., New York 17, N.Y.
Cable Address: SUMITMETAL NEWYORK

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	15.35
Cleveland *R3*	.....	.....	.....	.....	.....	.....
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	7.025	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	9.10	.....	.....	.....	.....
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *C4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Castle, Pa. *M10*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 43.50
Electrodeposited, 5000 lb lots 36.50
OFHC anodes ..... 41.50 to 44.50 (depending on shape)
Brass, 80-20, ball anodes, 2000 lb or more 50.50
Zinc, ball anodes, 2000 lb lots ..... 18.75 (for elliptical add 1¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb ..... 1.03 (Rolled depolarized add 3¢ per lb)
Cadmium, 5000 lb 1.60
Tin, ball anodes $1.26 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum, N. Y.. 65.90
Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit 17.45
Nickel sulfate, 5000 lbs 31.00
Nickel chloride, freight allowed, 100 lb 47.50
Sodium cyanide, domestic, del'd east of Rockies, 200 lb drums.... 25.80
Zinc cyanide, 100 lb, N. Y. 60.75
Potassium cyanide, 100 lb drum N. Y., del'd east of Rockies..... 46.50
Chromic acid, flake type, 10,000 lb or more, N. Y. 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50
Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75
Carbonyl Iron (200 lb lots) 88.00
Welding Grades 8.10
Cutting and Scarfing Grades 9.85
Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades
Electrolytic, domestic, f.o.b. shipping point. 15.00†
Atomized ..... 44.3 to 62.3
Reduced ..... 15.00†
Chemically Precipitated 45.5
Brass, 5000-lb lots ..... 33.1 to 50.3
Bronze, 5000-lb lots ..... 51.5 to 56.8
Chromium, electrolytic 5.00
Lead ..... 7.50†
Manganese, electrolytic ... $1.00
Molybdenum ..... $3.60 to $4.35
Nickel $1.15
Carbonyl Nickel, 20,000 lb lots $1.01
Nickel-Silver, 5000 lb lots.. 56.0 to 68.0
Silicon 70.00
Solder ..... 7.00†
Stainless Steel, 316 ..... $1.07
Stainless steel 304 ..... 89.00
Tin ..... 15.00†
Titanium, 99.25 + pct, per lb, f.o.b. $11.25
Tungsten, carbide grades... $3.25
Zinc ..... 19.5 to 32.7

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa *(J3)*; Beech Bottom *(W5)*; Brackenridge *(A3)*; Granite City *(G2)*; Indiana Harbor *(I3)*; Mansfield *(E2)*; Newport, Ky. *(A9)*; Niles, O. *(S1)*; Vandergrift *(U1)*; Warren, O. *(R3)*; Zanesville, Butler *(A1)*.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, P2, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	39.75
	316	42.20	46.25	50.25	58.25
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, $43.85; 1 side, $36.60.

(Effective July 24, 1961)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00
High duty (except Salina, Pa., add $5.00) 133.00
Medium duty 125.00
Low duty (except Salina, Pa., add $2.00) 103.00
Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00
Childs, Hays 163.00
Chicago District 168.00
Western Utah 183.00
California 185.00
Super Duty Hays, Pa., Athens, Tex., Windham, Wren, O. 163.00-168.00
Silica cement, net ton, bulk, Chicago 26.75
Silica cement, net ton, bulk, Ensley, Ala. 27.75
Silica cement, net ton, bulk, Mt. Union, Pa. 25.75
Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

Standard chemically bonded, Baltimore, Md. $620.00
Gary, Ind. 658.50
Standard, Pascagoula, Miss. 647.50
Standard chemically bonded, Curtiner, Calif. 119.00
Burned, Baltimore 585.00

Magnesite Brick

Standard, Baltimore $715.00
Chemically bonded, Baltimore 655.00
Chemically bonded, Pascagoula, Miss. 682.50

Grain Magnesite

St. ⅜ to ½-in. grains *Per net ton*

Domestic, f.o.b. Baltimore in bulk. $73.00
Domestic, f.o.b., Pascagoula, Miss... 80.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk 46.00
in sacks 52.00-54.00

Dead Burned Dolomite

F.o.b. bulk, producing points in: Pa., W. Va., Ohio $16.75
Missouri Valley 15.60
Midwest 17.00

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

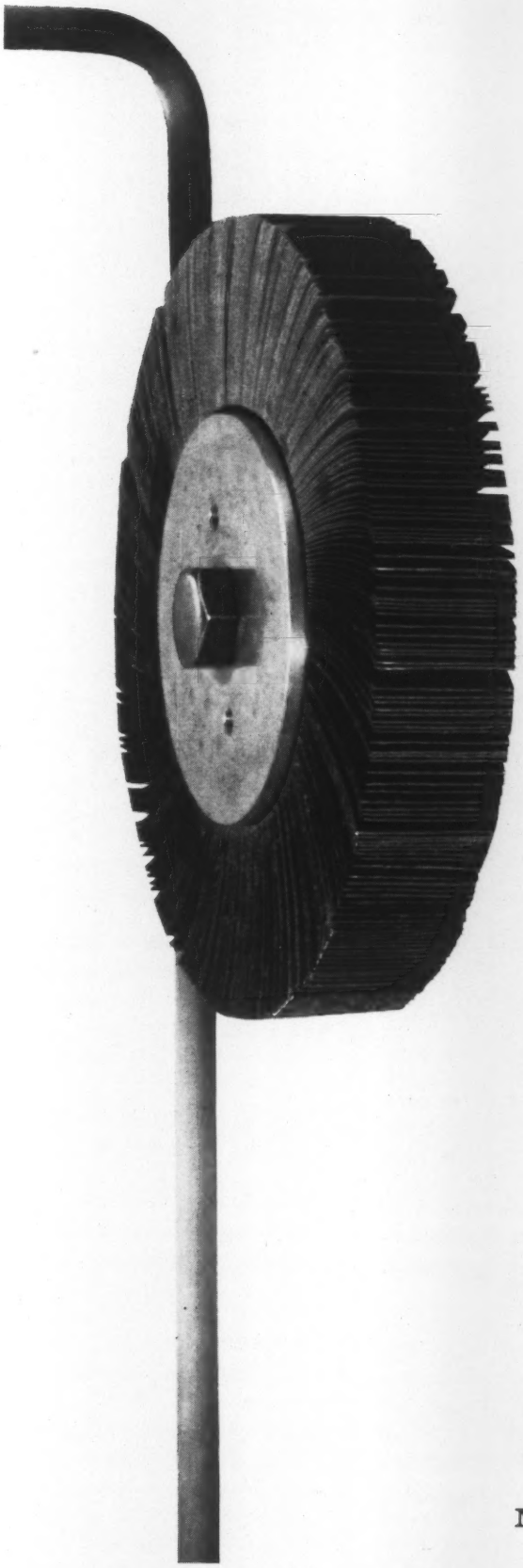
GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
Jones & Laughlin *	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

* Electricweld only.



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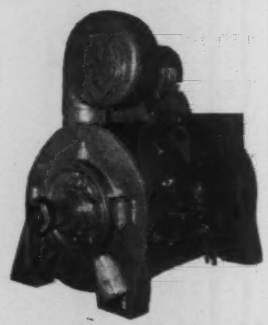

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New York Trade Is In Doldrums

Used machinery dealers in New York say inquiries and sales have been off in recent months.

But they look for a pickup by fall. Dealers say the second half should improve greatly.

■ The New York used machinery market is almost at a standstill. But this is pretty close to normal for the vacation period and dealers show little concern.

Inquiries started falling off in June. Dealers expect them to start picking up, however, in August and September. But there doesn't seem to be much conviction in their predictions.

Business has not been good for used machinery dealers in this area for most of this year. For most of them, business during the first half has run behind the same period last year. But many have held their own.

Adequate Supply — Dealers say all types of machinery are in more than adequate supply. Perhaps the most dramatic situation has been in heavy equipment for export, mostly to Europe. Reason: Delivery of new equipment in Europe has stretched out to well over one year in some cases.

There is little exporting to South America. Some dealers blame this on complicated import and monetary regulations. These dealers feel there is potential in the South American market if the doors were opened a little wider.

There have also been some inquiries for heavy equipment shipments to Japan. But most of these are considered to be preliminary. Actual sales appear far from firm.

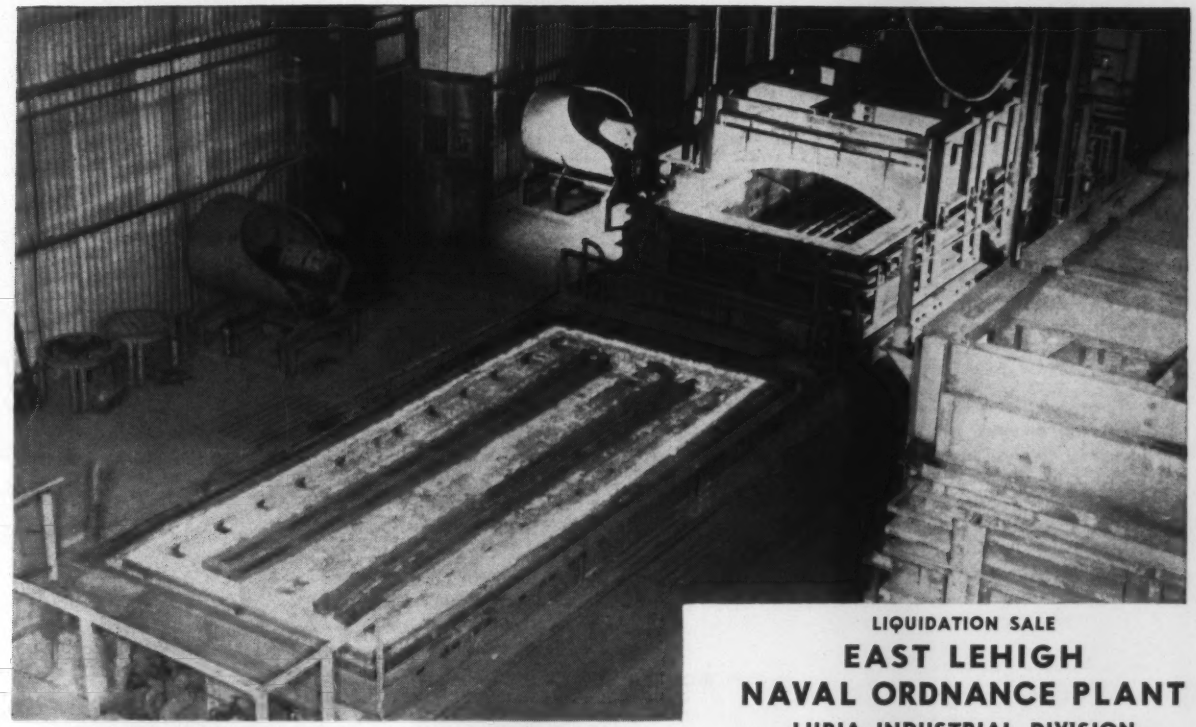
National Shopping — Some of the edge is taken off the heavy equipment market in this area because local buyers are starting to shop nationally. Area dealers say they still have the edge because of shipping costs. But the pressure is still on prices.

The price picture is actually slightly confused. A few dealers say their prices have gone up. There is no doubt that dealers would like higher prices. Since they are not doing the volume business they would like, there is some squeeze on profits. Overhead costs remain basically unchanged.

Sharpened Pencils — However, the competitive situation is still too strong. Most used machinery dealers in New York say their quotes are pretty much unchanged over the past several months. And many admit they will sharpen their pencils if that's what it takes to make sales.

While dealers are hoping for a fall pickup, they concede that they are likely to follow any overall pickup in the national economy. They seem to agree they won't sell many more machines until the business of potential customers improves more.

But they're betting that the second half will be better than the first six months this year. They say the final quarter should be the best period for 1961 sales.



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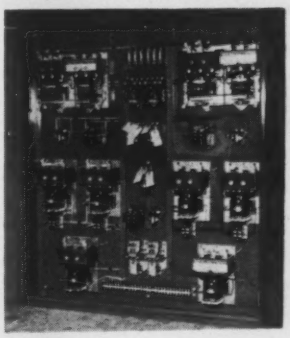

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528 CFM 100 psi 14 x 12 Penn. 3A
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676 CFM 110 psi 15-9¼ x 12 IR-XRE. 125 HP Syn 3-60-440
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28—Diesel Elec. Locomotives 25, 45, 65, 70, 80, 100 & 115 ton G.E., GM & Alcoa
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OR
STEEL SALES ENGINEER
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Top starting salary and company benefits.
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—Experience in steel mill and applied metallurgy preferred
—Sales engineering experience preferred
—Send written resume to
BOX H-202
c/o The IRON AGE, Chestnut at 56th, Phila. 39

SECRETARY, MALE OR FEMALE, wanted by Detroit machinery dealer. Must be capable of handling correspondence in English, German, French, Spanish. Permanent position. Good salary. Opportunity for advancement. Furnish detailed experience, salary record. Write to Box H-199, c/o IRON AGE, Chestnut at 56th Streets, Philadelphia 39.

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LEADING MANUFACTURER OF MOLDING AND CORE MACHINES, wants representative to cover Eastern New York, Eastern Pennsylvania, New Jersey, Maryland and Delaware territory. Excellent opportunity. Write, giving complete resume. Address: Box H-194, c/o IRON AGE, Chestnut at 56th, Phila. 39.

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MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

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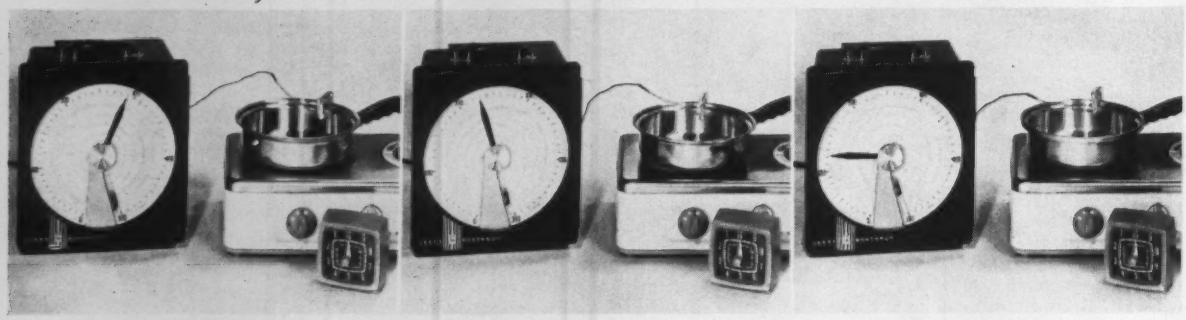

Fairmont Stainless Clad Aluminum
.100 THICK

Copper Core Stainless
.050 THICK

Carbon Core Stainless
.050 THICK

After five minutes at maximum distance from controlled heat source, pan made of Fairmont Stainless Clad Aluminum, even though double thick, shows 290° F at side wall—in comparison with 230° F for copper core pan and 120° F for carbon core pan. Utensils furnished by courtesy of Vita Craft Manufacturing Company. The testing devices courtesy, Leeds & Northrup.

LIGHTEST WEIGHT, WITH STRENGTH

Fairmont Stainless Clad Aluminum
.100 THICK

Copper Core Stainless
.050 THICK

Carbon Core Stainless
.050 THICK

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2 plus 2 equal 4. And Fairmont Stainless Clad Aluminum—with its unique combination of the strength and corrosion resistance of stainless steel permanently bonded to the light weight, good conductivity of aluminum—adds up to a bonanza in business-building product improvements. In many fields. From pots and pans to appliance and automotive trim, to architectural components. Whatever your line, the above has given you ideas. Let us help you with them. Write for further information. Or phone your local Fairmont office for a Fairmont field engineer.

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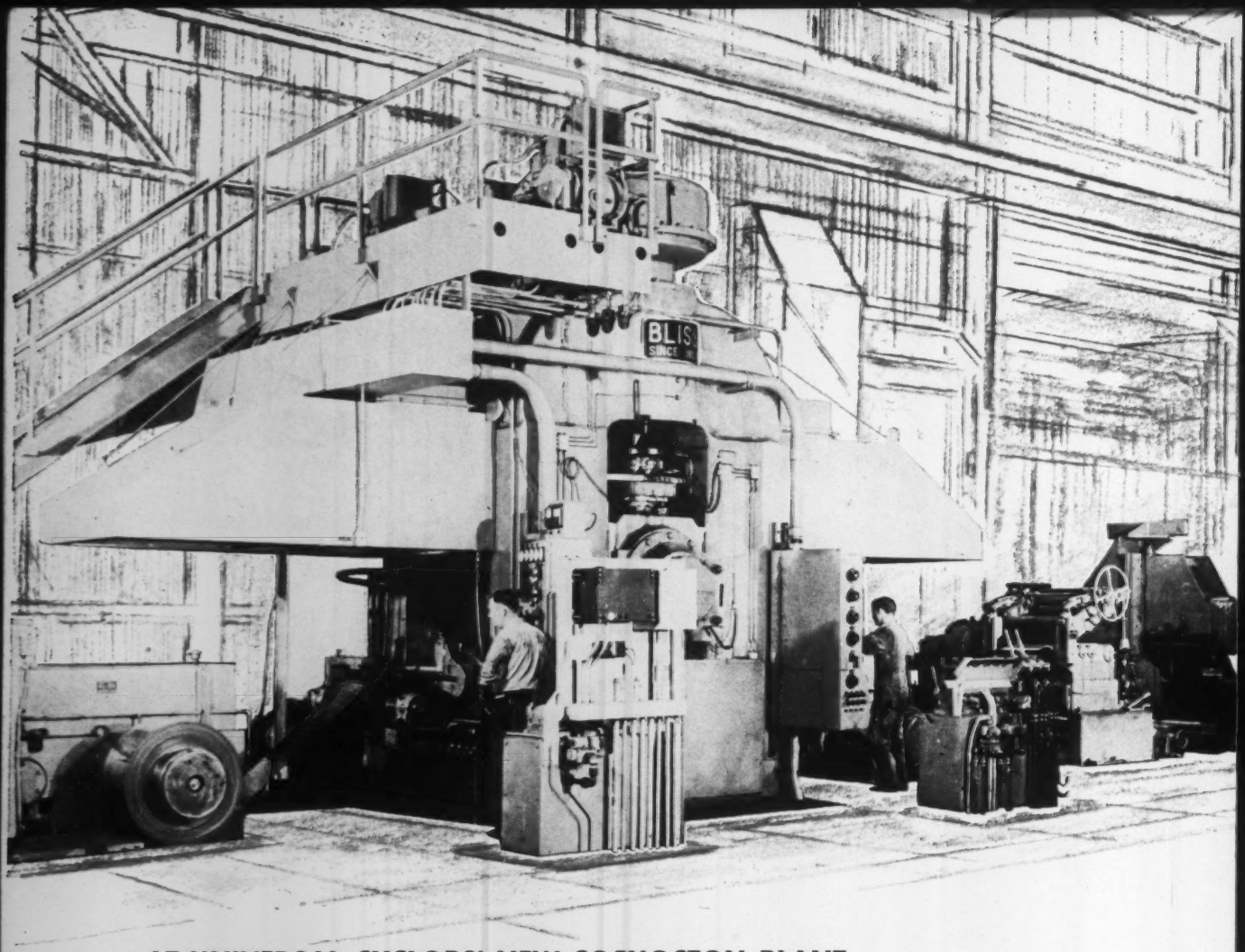
The quality reputation of Reeves TiteKote® galvanized steel—and Reeves finished galvanized products—is well established. Produced by the Reeves Steel and Manufacturing Division of Empire-Reeves Steel Corporation on a 36″ Wean line, TiteKote's excellent quality derives from both the outstanding operating practices of Reeves personnel and dependability of the equipment.

Installed at the Reeves Mill in Dover, Ohio in 1955, the Wean line has given trouble-free service since start-up. The Wheeling-type line handles gauges from 16 to 30, top speed on the lighter materials being 310 fpm. Strip from 18″ to 36″ wide in coils up to 26,000 lbs. is fed to the line after annealing and a temper pass on a two-high mill.

Wean's experience in continuous processing line design and construction has been built over 31 years service to the steel industry. Wean's "creative engineering" can make a major contribution to expansion or modernization of your finishing facilities.

WEAN

THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO



AT UNIVERSAL-CYCLOPS' NEW COSHOCTON PLANT:

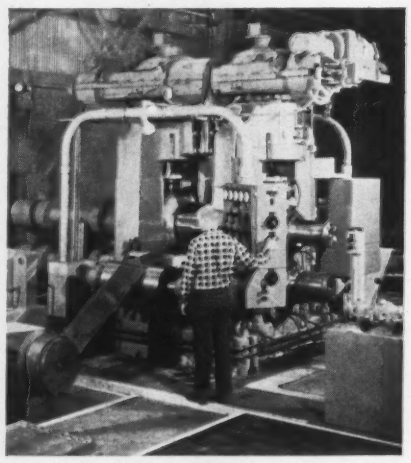
Stainless gets a fine finish fast

All the rolling at Universal-Cyclops Steel Corporation's new stainless strip finishing plant at Coshocton, Ohio, is accomplished on two rolling mills designed and built by Bliss' Rolling Mill Division. Steels rolled include all standard AISI grades in widths up to 24 inches.

Workhorse of the two mills is the 4-high reversing mill shown above. It is ruggedly built to stand heavy rolling stresses developed at speeds as high as 1000 fpm. Auxiliary equipment includes a three-stop coil entry ramp, coil buggy and mandrel-type payoff reel, flattener and feed roll, tension reels and coil buggies.

The two-high Bliss temper mill (right) is used principally for straight chromium grades of stainless providing proper hardness and a lustrous finish to the strip. An unusual design feature is the absence of an entry guide box, eliminating a source of dirt accumulation and strip scratching.

These two mills at Universal-Cyclops are typical of the modern approach to rolling mill design you'll find at Bliss. For other examples of our work, write us today for your complimentary copy of the 84-page Bliss Rolling Mill Brochure, Bulletin 40-B.



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